COMPUTERWORLD

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NEWSPAPER

Product Round-Up

Univac Adds Entry-Level System

By Esther Surden
Of the CW Staff

BLUE BELL, Pa. — Univac continued its march into the small systems arena last week with the introduction of an entry-level system in the 90 series that is said to compare with the IBM 3/12

Dubbed the 90/25, the system will be available in both card-oriented and cardless versions

At the same time, Univac announced a cardless capability for its 90/30 small-scale system and a 90/30B configuration that reportedly allows 90/25 users to upgrade to the processor power of the 90/30 without replacing 90/25 peripherals.

A typically configured cardless 90/25 with its bundled software costs about $3,425/mo including maintenance; a comparably configured IBM 3/12 costs about $3,696/mo excluding software, according to a Univac spokesman

The 90/25 and 90/30B are object code-compatible and the 90/25 can be upgraded to a 90/30B in the field, the firm added

The 90/25 can emulate Univac's older small-scale systems — the 9200 and 9300 — providing an upgrade path for those users, a spokesman said

The card-oriented system, available in July, includes the CPU and memory, operator console with a CRT, integrated card reader, an optional integrated card punch, integrated 300 line/min printer and the disk drive, Univac said

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HIS Makes Good on Xerox Pledge

By Toni Wiseman
Of the CW Staff

ATLANTA — Honeywell Information Systems, Inc. (HIS) announced plans for expanded memory, central processor and magnetic media capabilities for its Xerox users at a Xerox users group meeting here last week

But delivery of Control Program 6 (CP-6) — the operating system that will allow users to migrate to HIS' Level 66 — was postponed from late 1978 to early 1979

When HIS agreed to purchase the Xerox user base in October 1975, the firm pledged itself to providing a growth path for current Xerox users to extend the lives of their systems as they approach saturated operating conditions with their central systems, according to an HIS spokesman

The products announced last week were designed to assure both an orderly growth path and transition program for users requiring greater processing power and functionality, he said

The announcement included MOS memory subsystems for the Sigma 6, 7 and 9, dual-processor options for the Sigma 6 and 7; a virtual

(Continued on Page 6)

Amdahl Doubles 470V/6 Buffer

SUNNYVALE, Calif. — Amdahl Corp. doubled the storage capacity of the buffer memory on its 470V/6 CPU and claimed a 5% to 15% improvement in mainframe throughput.

The company also announced it would finance up to 12 operating leases yearly Amdahl previously offered customers only direct purchases or third-party lease arrangements

Systems with the larger 32K-byte buffer will be called the 470V/6-II The increased storage will be made available on new systems and can also be installed in the field in about 10 hours

The option, which costs $150,000, requires no software changes, Amdahl said

Prospective users ordering the 470V/6-II can expect the system to cost about $200,000 more than the 470V/6. A typical 4M-byte 470V/6-II costs $4,635,000, Amdahl stated Monthly maintenance for the increased storage feature is $100

The 470V/6-II will be available in the third quarter, field upgrades are planned for the fourth quarter

Internal Memo Reveals

IBM Sets Its Prices 'Arbitrarily'

By Catherine Arnst
Of the CW Staff

NEW YORK — IBM has "arbitrarily and artfully" set the prices users pay for computer systems, according to a confidential memo from the firm's files.

IBM has historically established a value system for computer equipment that has no relation to the value of alternative methods of doing the job or to manufacturing costs, the document said.

The 21-page memo, recently entered into evidence at the U.S. vs IBM antitrust trial here, is a study of corporate strategies written in December 1971 by Hilary Faw, corporate treasurer, for Frank T Cary, now chairman of the board

Faw outlined actions meant to ensure that computer users would stick with the systems-oriented approach favored by IBM rather than going to a less profitable "appliance" approach where users would buy parts of systems from various vendors.

IBM did not want to prevent a fragmented computer industry for purely selfish reasons; its concern was what was best for the nation, the document indicated

"We have the experience, confidence, intelligence and resources to restore a systems-oriented order to what is on the way to becoming a fragmented appliance business," according to Faw

"We know, better than most others, that data processing requirements do not lend themselves to the 'appliance' approach — and if we allow it to continue, there will be no potential growth for the industry, little profit for those engaged and eventual destruction of a national asset which can contribute to hope for a better future," Faw stated.

During the punched card era, systems were priced according to the value of the method they displaced, the document said. IBM systems were thus subject to functional pricing rather than pricing based on manufacturing costs.

Once the computer era started to emerge, displaceable cost considerations diminished because the complexity and size of the processing that had to be done "was such that the punched card technology was inadequate regardless of quantity utilized," the document noted.

IBM began to set up an "arbitrary" value system, Faw wrote It priced its 701 at $15,000 — half its actual value — because "we thought there would not be enough takers at the required price — that this was simply too far outside the range of displaceable cost considerations."

The 702, at $30,000, was also priced too low, and IBM expected only six takers," Faw said. It obtained 60 orders.

"We then withdrew the 702 and substituted the (only slightly modified) 704 at $45,000 and retained most of our original takers, he added.

As the DP industry grew, many users relegated cost-of-the-old-way vs. cost-of-the-new to the realm of minor considerations Using a computer had become a "prestige" factor, Faw claimed

"These systems came to be regarded as necessities, not capital assets acquisitions to be painstakingly evaluated for their potential return on investment."

The IBM 360 system caused displaceable cost to virtually disap-

(Continued on Page 5)

Bell Bill Countermeasure Set for House Introduction

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C — A procompetition resolution planned as a "countermeasure" to the AT&T-fostered Consumer Communications Reform Act will be introduced soon in the U.S. House of Representatives.

The joint resolution was designed as "a reaffirmation of congressional intent regarding competition in the telecommunications industry" and as a "statement of support for the procompetitive actions taken by the [Federal Communications Commission (FCC)] and the courts during the past decade," according to a letter being circulated to members of Congress.

The resolution is being sponsored by Richard Ottinger (D-N.Y.), Charles Whalen Jr. (R-Ohio) and Timothy Wirth (D-Colo.) to blunt efforts by the telephone industry for reconsideration of the Reform Act, originally introduced in Congress last spring

The Reform Act was reintroduced in the House several days after Congress reconvened by Teno Roncalio (D-Wyo.) in essentially the same form as the first version.

As of last week, about 30 members of the House had sponsored the bill and a Senate version was introduced by Clifford Hansen (D-Wyo.).

The procompetition resolution, as proposed in the "final draft" version, said "competition is hereby reaffirmed as the best means of serving the American consumers' diverse and rapidly changing telecommunications needs, except where there is clear and convincing evidence that such competition would produce unreasonably higher costs or poorer service for the American consuming public "

The resolution stated the FCC "has determined that competition is feasible in certain sectors of the U.S. telecommunications industry" and "public interest is better served by permitting consumers to obtain specialized services and equipment from any company or individual that is ready, willing and able to meet consumer needs or demands —

(Continued on Page 2)

Weather or Not....

By Ann Dooley
Of the CW Staff

CAMP SPRINGS, Md. — While the country staggers under severe winter weather conditions, the people directly involved in computing and forecasting the weather have been going about their business as usual

But what a business it is, according to James O'Connor, deputy chief of the forecasting division of the National Meteorological Center

The center is one of several agencies of the National Oceanic and Atmospheric Administration (NOAA) that collects and analyzes weather data for use in day-to-day forecasting

The information gathered is used by the National Weather Service to construct numerical weather prediction models.

The models include an "Early Look," regional, northern hemisphere and global simulations. The first two make a 48-hour forecast twice daily and the northern hemisphere model is done in 60- and 84-hour cycles.

The global model is simulated on 12- and 24-hour cycles from satellite and numerical data which is continuously entered into the computer system.

All the information is compiled to make the daily, 30-day and seasonal forecasts which are sent to all weather stations throughout the country

The system consists of three IBM 360/195s operating under

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Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass 02160 Phone (617) 965-5800 Telex 92-2529

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Because of Jurisdictional Appeal

Court Puts Bell Antitrust Case on Hold

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — The U.S. District Court of Appeals here has halted progress on the Justice Department's antitrust suit against AT&T until it can rule on jurisdictional issues raised by the phone company.

The suit, which had just gone into its discovery phase in December, was delayed for an indefinite period. The court ordered both parties to file responses to the issues within 30 days.

The court also invited the Federal Communications Commission (FCC) to participate if it desires to comment.

The action by the appellate court followed a rejection by the U.S. Supreme Court of a similar AT&T petition [CW, Feb. 7]. The phone company is attempting to get review of a district court ruling that the antitrust trial can be heard in the district court and should proceed.

AT&T has charged that the lower court does not have jurisdiction and that to proceed with the trial would include a 10-year discovery period which could cost the Justice Department and AT&T "in excess of $1 billion."

Unlike the Supreme Court, the U.S. Court of Appeals is not under a deadline to act on the AT&T petition, according to one Washington legal source. In some cases, it has taken the court as long as 10 months to act on appeals of this type, so it is difficult to predict how soon a decision will be handed down in this proceeding, the source said.

In ordering a delay in the suit, the appeals court ruled that "further proceedings in the U.S. District Court be stayed until the further order of this court."

A Justice Department spokesman said last week there might be some room for "definitional argument" on whether some exploratory talks between the parties can take place. "But the bottom line is that it would be a great mistake to expect any material progress in this case until the appeals court acts," he added.

An AT&T spokesman said "the Bell System is encouraged that the court is now reviewing the matter."

An FCC staff spokesman said it was not clear whether the court was asking for comments on the jurisdictional issues. If that is the court's intent, then there is a good chance the commission will participate with a position paper, he said.

The FCC staff intends to ask the court for clarification, he added.

Bell Bill Countermeasure Drafted

(Continued from Page 1)

rather than by limiting communications users to a sole-source monopolist."

Consumers have benefited from competition because it has permitted suppliers of goods and services to provide them more efficiently and at lower cost, the resolution also stated.

A cover letter sent with the draft version of the resolution from Wirth's office and signed by all three sponsors of the resolution stated that last year AT&T spent nearly $2 million "lobbying for the telephone industry-written" Reform Act. Wirth has made numerous statements concerning Bell's spending to support the proposed legislation.

In a recent speech to the Denver Cable Club, Wirth said the phone company "spent about $2 million — or $4,000 per member of Congress — lobbying for the so-called Consumer Communications Reform Act last year. I expect Bell to spend even more money on its lobbying campaign this year."

The $2 million figure was first quoted in AT&T reports submitted by the phone company to the FCC. These reports showed AT&T spent $2,040,849 in promoting the Reform Act in the last quarter of 1975 and the first three quarters of 1976.

Part of the money was used to contact all members of Congress by a Bell official who typically explained the intent of the legislation.

In explaining the totals listed in the reports to the FCC, an AT&T spokeswoman said "the expense incurred in connection with the Consumer Communications Reform Act is not a lobbying figure. In fact, only a small part of this money was for contacting legislators.

"Most was spent in seeking public and employee understanding and support of the industry position — especially for booklets, employee meetings and the like.

"As of now, almost all of the $2 million is being absorbed by the business and is not being passed along to customers," she stated.

"We intend to comply fully with tax laws and any tax deductions taken will be in strict accordance with laws when we file our return next September," the spokeswoman said.

While it is not known how much AT&T is spending to support the version of the bill pending in the current Congress, one Washington source said the total of 30 sponsors to date, plus a few in the Senate, indicates that legislators are more hesitant to back the proposed legislation.

Last year, in the 95th Congress, 175 representatives and 16 senators sponsored the legislation.

The procompetition resolution is expected to be formally introduced in the House during the next two weeks. Reaction to the draft version and letter that was circulated has been encouraging, but an estimate of potential sponsors is not yet available, according to a spokesman for Wirth's office.

Commenting on the resolution, an AT&T spokesman said "the basic premise is incorrect. American consumers have traditionally relied on a regulated telecommunications industry to provide them with the best telephone service in the world at the lowest prices.

"The resolution supporting the FCC's policies would force the price of residence service higher — most likely out of the reach of many Americans who now have it," the spokesman said.

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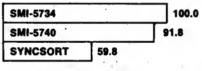

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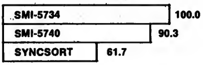

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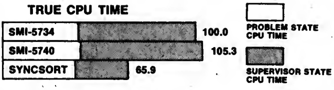

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DP-Based Rail Operations Endure Freeze 'As Expected'

By Frank Vaughan
Of the CW Staff

PITTSBURGH, Pa. — Computerized rail-switching and signaling operations have held up "as expected" during the recent freeze in the Midwest, according to a spokesman here.

The freeze, which has virtually crippled both the Midwest and Buffalo, N.Y., areas, has disrupted rail operations. But, the computerized functions are not the culprit, according to John Hansen of the Union Switch and Signal Division of Westinghouse Air Brake Co. here.

The culprit, he said, is simply the massive quantity of snow that has been impossible to clear from tracks and rail yards.

Computer-operated switches are protected from freeze-ups in two ways: by switch heaters that melt snow and ice and by snow blowers that periodically send a blast of air over the critical switch, blowing away any snow that has built up, Hansen explained.

In addition, each switch has several electrical and mechanical detectors built in to alert any oncoming trains if the switch is in an unsafe condition, he said.

In cases of deep snow when it is impossible to clear a section of track, trains are rerouted hundreds of miles out of the way, often over the tracks of competitors, in order to eventually reach their destinations, Hansen said.

One such example of this was in the Buffalo area, where heavy snows closed down the lines formerly belonging to the New York Central Railroad.

When those lines were closed, operations were switched further south to the Penn Central railbeds, according to Hansen.

In the South, where fewer provisions for snowfall were made, the computer-based operations functioned as expected and the only concession that rail operations made to the rare snowfall was to send teams of men with brooms and shovels to clear snow from unheated switches.

The computers used in the railroad operations, whose function is to provide separation, protection and routing, are protected from the elements and have programmed safeguards for use when the occasional switch freezes or when a line is closed because of snowfall, Hansen explained.

There have been no difficulties with the computers' ability to keep up with the changes, reroutings and problems caused by the weather, Hansen added.

The systems have sufficient capability to handle the increased workloads, he noted.

Univac Adds Entry-Level System

(Continued from Page 1)

A basic 90/25 cardless configuration, available in November, includes a CPU and memory, console with CRT, integrated diskette system, integrated printer and an integrated disk drive.

Included in the 90/25 CPU are microprogrammed logic, an integrated peripheral channel (IPC) and controls and an integrated disk adapter. A communications adapter can be attached to the IPC for communications devices, Univac said.

The communications adapter controls three lines, one of which can be full-duplex at speeds up to 50 kbyte/sec, the firm said.

Main memory for the system is 16K-chip MOS expandable from 65K bytes to 131K bytes. Memory cycle time is 600 nsec for two bytes, the spokesman noted.

Univac also announced four peripherals for use with the 90/25 system — a 300 card/min card reader, a 300 line/min printer, a diskette subsystem and a disk subsystem. The peripherals are controlled by the IPC.

Users can configure the cardless 90/25 using the 8413 diskette subsystem. This subsystem, which uses IBM-compatible floppy disks with a data capacity of 242,944 bytes, can read 128-byte records at 1,500 record/min. Write time is 850 record/min, the company stated.

The diskette subsystem can be used by present 90/30 users, the spokesman added.

The 8415 disk drive provides both fixed and removable storage. The unit can accommodate up to 24.8M bytes of fixed storage and 8.3M bytes of removable storage for a total of 33.1M bytes, he said.

The 90/25 can also support a magnetic tape subsystem and an 80- and 96-column card reader. A Univac 9200/9300 system channel adapter attaches to the system via an integrated multiplexer channel operating at 83 kbyte/sec, allowing 9200/9300 users to use their systems in conjunction with the 90/25, the firm stated.

The system runs under Univac's Operating System/3 (OS/3), which has been modified to provide support for the disk drive and diskette subsytsem. OS/3 also provides support for data communications between the system and terminal devices.

The operating system supports up to seven jobs running concurrently within three priority levels. Multijobbing job steps are interleaved to increase throughput.

The 90/25 also uses the Integrated Communications Access Method for communications and the IMS/90 information management system to provide data file inquiry and update capabilities.

A basic 90/25 with 65K bytes of memory, 33.1M bytes of disk storage, 300 line/min printer, 300 card/min card reader and a 75- to 160 card/min optional card punch costs about $3,600/mo to rent, including maintenance. On an extended term lease, the monthly cost is $3,200; the purchase price is $134,500.

A basic cardless 90/25, which includes a diskette subsystem instead of the reader/punch, costs $3,500/mo to rent, $3,100 monthly on the lease plan and $129,850 to purchase.

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Power Down for Six Days

Disaster Plan Keeps Bank in the Money During Outage

By Frank Vaughan
Of the CW Staff

DAYTON, Ohio — A strong disaster plan proved invaluable for the Winters National Bank here when an electrical fire left the bank and its processing center without electrical power for six days last month.

The fire, which started when a water pipe burst over the 30-story tower's main power bus, destroyed three buses, leaving the nine-floor banking facility without power.

The Wednesday night processing was nearly complete when the power outage occurred at 5 a.m., according to Bob Golitz, vice-president of systems and planning for Winters.

There was no loss of memory or any damage to the bank's three CPUs — two NCR Corp. Century 300s and a Century 201 — or to its peripheral equipment, Golitz said. However, the bank was faced with the problem of keeping up with the proofing of the 400,000 cheeks and other items it handles daily.

Planning Pays Off

The bank normally uses 37 NCR 775 proof machines to do this job, and here is where the prior planning began to pay off, Golitz said.

Under previous agreements, Winters was allowed to use the proof machines of its competitor banks while NCR began a search for additional machines. Within 30 hours, NCR had provided 12 additional proof machines, an effort that caused Golitz to remark, "I just couldn't believe it!"

Later, the bank was able to jury-rig a generator to allow the use of 10 more.

Interim check processing and sorting was accomplished at Dayton Power and Light, Golitz said, and NCR was able to provide two operational Model 671 sorters within 36 hours. All of the equipment NCR provided was set up at the vendor's Corporate Information Processing Center, also in Dayton.

Part of the difficulty faced at Winters was logistical. The bank's DP facility was located on the ninth floor and because of the power loss over 100 disk packs had to be carried down dark stairwells. These packs were then transported to other user sites and the NCR facility for processing.

In addition, a temporary operations center was established in a vacant building adjacent to the tower. Equipment was carried from the ninth floor of the tower and set up in the temporary center.

Despite difficulties and delays, Winters was able to balance daily and there was no loss of funds or of documents throughout the paper shuffling, according to Golitz.

Power was restored to the building at 4 a.m. on Jan. 26, 143 hours after the initial fire. Seven hours later, Winters was operating its own system again, Don Miller, NCR's head of sales for banks, recalled.

Golitz credited Winters' successful emergency operation to having a strong, current emergency plan coupled with "outstanding" support from NCR.

Memo Reveals IBM 'Artfully' Set Prices

(Continued from Page 1)

pear, the document said. IBM "now sold price/performance and improved function by comparison with a previously established value system, which had been created by ourselves" and had no relation to the actual cost of the product, Faw said.

He illustrated this statement with the notation that "memory prices set in 1955 were unchanged although costs had dropped precipitously since then."

The erosion of displaceable cost was partially a result of the "new breed of professional programmers" who were interposed between top management and in-house users of the output.

They "rendered all but impossible the gaining of any insight on what the value" of computer equipment was to the firm, Faw said.

Additional factors in that erosion were the complexity of the machines, management's inability and lack of motivation to understand the system and the "natural instinct for self-preservation among DP professionals, who are hence reluctant to have management gain an understanding which could result in reducing or eliminating the professional's role," Faw added.

When IBM was forced to unbundle and could no longer include education and maintenance in its system price, system billing no longer offered "a rational and viable recovery medium for the investment and risk of the DP systems vendor," the document found.

Independents Impacted Market

The independent peripheral manufacturers began to have an impact on the computer market, which IBM felt it subsidized "by doing their marketing, systems control programming, systems support and, in many cases, their engineering so that they need recover, in essence, only manufacturing cost."

IBM, in contrast, needed to sell a total system to cover all its costs. The document emphasized the need for the corporation to establish a new value system.

But there was concern that "the combination of our past price leadership, exploitation of functional pricing and the user's past indifference to value analyses has led to significant overvaluation of the true economic utility of DP," Faw wrote.

The document ended with a display of verbiage possibly designed to show Cary that IBM could be the salvation of both the computer industry and the nation.

"Our less cosmic motivation is that we built the ship in which we are sailing. We have a hundred foreign smaller ships in tow who are relaxing in the wake of our weakening sails and we cannot simply lower sails or anchor, because we are in mid-ocean.

"We have no alternative but to patch our sails, establish a true course and proceed to our port of destiny.

"To do less would represent a betrayal of ourselves as management, our stockholders, our employees and possibly the national interest," Faw concluded.

How We Care for Them

Xerox Users Pleased With Show of Support From HIS

By Toni Wiseman
Of the CW Staff

PHOENIX — As far as the users are concerned, Honeywell Information Systems, Inc.'s (HIS) product announcement last week "breathed new life" into dying equipment, according to Randy Best, president of Exchange, the Xerox users group.

Exchange members met with HIS management in Atlanta recently to discuss the future of Xerox users and HIS' part in that future [see story on Page 1].

When Xerox announced its intention to pull out of the computer business, its users took a long look at their needs and drafted a lengthy series of "demands" to HIS, which had agreed to assume responsibility for service and marketing support functions for Xerox users.

The demands included new and better peripherals retrofitted to Xerox iron, MOS memory and enhancements to the Control Program V (CP-V) operating system.

"Most people expected a replay of what happened after RCA and General Electric went under — a general wind-down with a minimum of service," Best said.

"But, instead, Honeywell announced about 90% of our demands at the users' meeting. Instead of downgraded service, we've gotten such things as MOS memory at one-eighth or one-tenth the price we previously paid for core.

"This means I can double the memory on my Sigma 9 and not increase the cost, getting MOS to boot," Best, who works in Motorola Corp.'s DP center here, said.

"Everyone at the meeting agreed that we now have enough to survive and that we have an easy conversion path if we want it," he continued, noting that HIS is converting CP-V to its new systems architecture.

Exchange had a working agreement with Xerox under which operating system, language processor and communications technical committees worked, under nondisclosure agreements, with the manufacturer on new products, according to Best.

The same holds true for HIS, and the firm is really doing its share, Best said.

HIS Comes Through on Its Pledge to Xerox Users

(Continued from Page 1)

memory subsystem for the Sigma 5; and removable disk storage and magnetic tape subsystems for the Sigma and 500 series computers.

The products augment the CP-6 development effort, previously announced, to provide a next-generation CP-V system operating on HIS Series 60/Level 66 computers [CW, June 28].

For the Sigma 9, HIS' MOS memory subsystem, which will be available in the third quarter, is a plug-compatible add-on alternative to Sigma core memory which operates either in conjunction with or as an alternative to the core system, the spokesman said.

Memory capabilities range from 128K to 512K on a fully expanded Sigma 9 system. Cycle time is said to be 750 nsec.

Two-way or four-way interleaving is offered, however, on systems with mixed MOS and core memory; the core must be four-way Interleaved, HIS said. This means the core must be configured in 64K-word increments only, the spokesman explained.

The XPF 9850 Sigma 9 MOS memory subsystem includes a system controller, 128K words of memory and two ports for the entire memory unit. Purchase price is $130,000 with a monthly maintenance fee of $279.

The Model XPF 6850 MOS memory plan for Sigma 6 and 7 users includes an extended memory map, I/O processor upgrades, the same MOS memory available for the Sigma 9 and a Sigma-compatible memory interface.

The package, which is supported by CP-V, will double the maximum memory size available for the Sigma 6 and 7 to 256K words.

Purchase price for a unit with 128K words of MOS memory is $140,000 with a monthly maintenance fee of $285. All will be available in the fourth quarter.

Along with the added memory capacities for the Sigma 6 and 7, HIS announced a dual-processor option, the XPF 6851, which shares common memory and I/O processors and is said to provide significant increases in computing power over single-processor Sigma 6s or 7s.

A single copy of CP-V supports the dual processor configuration; one CPU is used as the controlling processor and the other as the secondary or slave mode computing resource, according to the spokesman.

The additional processor can be purchased for $70,000 with a monthly maintenance charge of $600 and will be available in the fourth quarter.

Sigma 5 users with memory fragmentation problems will be able to overcome them with the XPF 5850 virtual memory subsystem, an architecture upgrade including a memory map and 32K- to 128K words of core memory, HIS said.

XPF 5850 will allow Sigma 5 users to migrate to either CP-V or CP-R, the control program for real-time applications, the spokesman added.

The XPF 5850 entry package, which includes 32K words of memory and is available as a field upgrade, is initially supported by CP-R.

The package is offered on a purchase-only basis for $31,000 with a monthly maintenance fee of $580. Shipments will begin in the second quarter.

HIS also announced the XSP 9210 removable disk mass storage subsystem and the XTP 9310 magnetic tape subsystem for Sigma and 500 series users..

The disk subsystem will be available in the third quarter of 1977, followed by the tape subsystem in the first quarter of 1978.

The XSP 9210 consists of a microprogrammed mass storage processor and four high-speed disk units providing a formatted storage capacity of over 690M bytes.

Up to 11 additional disk units may be added to each processor for a maximum of over 2.6G bytes per storage processor.

Software support is provided under CP-V only for the Sigma 6, 7, 9, Sigma 9 Model 2 and Model 560 computers.

Purchase price for the XSP 9210 processor and four 173 million byte disk drives is $191,350, with monthly maintenance fees of $639.

The Model XTP 9310 dual-density (800- or 1,600 bit/in.) magnetic tape subsystem includes an XTP 9310 magnetic tape processor and up to 15 9-track HIS XTU 9312/9313/9314 tape units.

The three tape units each double the transfer rates in shifting from 800- to 1,600 bit/in. modes, the spokesman said. At 800 bit/in., the XTU has a transfer rate of 60 kbyte/sec; the XTU 9313, a 100 kbyte/sec rate; and the XTU 9314, 160 kbyte/sec.

The XTP 9310 processor sells for $26,640 with a monthly maintenance fee of $140. The XTU 9312 sells for $16,402, the XTU 9313 for $21,300 and the XTU 9314 for $25,000.

The three tape units operate with the XTP 9310 and, when purchased, carry a monthly maintenance fee of $150.

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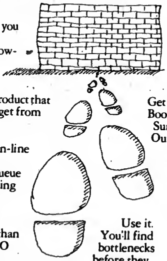

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Weather or Not, NOAA Forecasters Busy Collecting Data From the Skies

(Continued from Page 1)

the Advanced Scientific Computer (ASC) system and linked together by a common disk.

The forecasters also use three 360/40s and one 360/30 to predict the weather, O'Connor said.

The system is so complex that the extreme weather conditions did not increase the workload, he noted. "Forecasting foul weather is the same as forecasting good weather," he explained.

However, he did say he has noticed an increased interest in the weather conditions because weather extremes affect the economy.

Forecasts have been especially accurate this winter, according to O'Connor. The chief reason for this, he believes, is that abnormal weather conditions have persisted without major interruptions. Another reason is that the mathematical models have simply been doing a better job this year, he said.

One ray of hope for a break in the weather offered by O'Connor is that weather statistics tend to balance out in the long run so, at some time in the future, comparative warming trends will be experienced.

When this will actually occur is anybody's guess since the next 90-day forecast won't be computed for several more weeks, he said.

Satellites Gather Data

Raw weather data is obtained from two types of satellites: polar-orbiting and geostationary, according to Robert Green, meteorologist at the National Environmental Satellite Service, another NOAA agency.

Two polar-orbiting satellites follow the route of the sun and make 12 to 13 orbits daily, circling the earth every 100 minutes, he said.

From 450 nautical miles above the earth, they deliver detailed information on the same small areas of the globe twice a day.

Data is obtained from a scanning radiometer on the satellite which transmits the infrared and visible data of each separate orbit and relays it to a readout station below.

When it passes a station, the tape-recorded data is played back, broken down and sent by minicomputer to the main processing station here, where it is transferred to magnetic tape and entered into the 360/195 system, Green said.

This orbiting satellite transmits complete global coverage and creates a photographic image, temperature mapping schemes and vertical mapping profiles.

The geostationary satellite, 22,500 nautical miles above the earth, maintains a constant surveillance of an area 55° north and south of the equator.

The combination of a constant and rotating surveillance create a complete weather outlook, Green said.

The raw data is sent from the reading stations to the main system by tape or on-line, according to James Howcroft, branch chief of the Automation Division at the Meteorological Center.

Several Data General Corp. (DG) Novas and Interdata Corp. Model 50 minicomputers receive the weather data from the various global links and then assemble and process it.

They can generate hard copy or store the data on disk packs on the 360/40s, Howcroft said.

Once the 360/40s are fed the observational data, they identify and reformat the information.

They also store and transmit graphical information and, with minicomputer links, process weather pattern distribution charts, O'Connor said.

The 360/40s store the data for an interval and then dump it into the 360/195s, which take the raw data and systematize it into some form of spectral mode, run numerical models or do graphic schemes, he said.

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FCRA Guidelines Ask Separate Credit Files for Women

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Credit Bureaus will not be able to automatically incorporate the credit history of one spouse into the credit record of the other under guidelines proposed by the Federal Trade Commission (FTC) here recently.

Open for public comment until March 15, the FTC's suggested interpretations of the Fair Credit Reporting Act (FCRA) would also require credit bureaus to establish separate credit histories for women based on relevent information previously filed only in their husband's names.

The agency said it proposed these guidelines to clarify the relationship between the FCRA and the Equal Credit Opportunity Act. The former was designed to protect consumers from circulation of inaccurate or obsolete credit information about them. The latter was enacted to prohibit creditors from discriminating on the basis of sex or marital status in any credit transaction.

Creditors, credit bureaus and consumers have expressed concern that the FCRA can be interpreted as limiting a creditor's access to credit information needed to evaluate married or formerly married women applying for separate accounts.

According to the FTC, this could be a special problem during the initial stages of implementing the Equal Credit Opportunity Act.

All these groups share a common interest: assuring that credit-worthy women can obtain credit and maintaining the integrity of the credit information system, the commission added.

The guidelines are intended to minimize the impact of the FCRA on the goals of the Equal Credit Opportunity Act, and will not become final until the FTC has reviewed public comments.

Under the Equal Credit Opportunity Act, all accounts opened after June 1 of this year which both spouses use or for which both are liable must be reported by creditors in both names.

In addition, as of that date a consumer will be able to require a creditor to report the credit history on any account already shared to credit bureaus in both names. The lack of accessible credit histories for women has severely restricted their ability to obtain credit, the commission said in a statement accompanying its proposed interpretations.

This lack of credit history resulted from a variety of practices, most of which involved overt discrimination against women and helped cause the passage of the Equal Credit Opportunity Act, the commission said.

Designers' Forum Added to Format

1977 Computer Caravan Getting Ready to Roll

NEWTON, Mass. — Minicomputers in distributed processing will be among the subjects featured at the 1977 Computer Caravan's Users' Forums scheduled for nine major U.S. cities.

Sponsored by Computerworld, Inc., the program will open on March 29 in San Francisco and travel to Los Angeles, Cleveland, St. Paul, Chicago, New York, Philadelphia and Washington, D.C., and wind up in Boston, according to Forum Director Edward J. Bride.

New this year is a series of Designers' Forums for technical personnel that will be presented in San Francisco, Los Angeles, Chicago, New York and Boston, Bride said.

The Users' Forums as well as exhibits of computers and related equipment and services will be held in all nine cities.

Users' Forum

Each day a nationally known speaker will address the Users' Forum audience, speaking on a topic related to the day's theme. Following this "keynote" talk, a local consultant will present a tutorial highlighting four specific subtopics of the day's theme.

Four local users will then expand on each of the subtopics in case-study fashion.

The Caravan's Designers' Forum will offer eight presentations during the three-day conference.

Day One of the Users' Forums is dedicated to applying minicomputers. Case studies will include "The Mini as a Mainframe" in the small business environment; two sessions on "Distributed Minis" and two more on the "Organizational Impact of a Distributed Mini System," Bride said.

Day Two will be devoted to managing terminal networks and will include sessions on "On-Line Terminal Networks," "Intelligent Terminal Networks," "Remote Batch Systems" and "Communications/Control Aspects of a Network Using Minis."

The sessions for Day Three, aimed at improving software productivity, will include "Personnel Recruiting," "Selection and Training," "Software Alternatives," "Measuring Systems Utilization" and "Documentation and Maintenance Aids."

The Designers' Forum on the first day will explore the evaluation and use of microprocessors. It will include "Applications of Microprocessors and Minicomputers," "Interfacing and Integrating" and "Emerging Applications."

Evaluating mini- and microcomputer peripherals will be the topic for Day Two with sessions on "I/O Devices" and "Magnetic Media and Its Future."

On the third day, attendees will participate in sessions on evaluating memory and storage devices. Presentations will examine "CCDs vs. MOS," "Bubble Memory" and "Today's Technology in Tomorrow's Products."

Forum sessions will be held in or at facilities near the exhibition hall.

Additional details on the program are available from Bride at the Computer Caravan '77, 797 Washington St., Newton, Mass. 02160.

Caravan Schedule

March 29-31	**San Francisco Civic Auditorium**
April 5-7	**Los Angeles Convention Center**
April 19-21	**Cleveland Convention Center**
April 26-28	**St. Paul Civic Center**
May 3-5	**Chicago's McCormick Place**
May 10-12	**New York Coliseum**
May 24-26	**Philadelphia Convention Center**
May 31-June 2	**Washington, D.C.'s Sheraton Park Hotel**
June 7-9	**Boston's Northeast Trade Center (Woburn)**

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Call for Papers

FIFTH DATA COMMUNICATIONS SYMPOSIUM, Sept 27-29, Snowbird, Utah.

Papers related to data communications emphasizing the following areas are invited. Impact of networks on host system design; progress of computer manufacturers in data communications; choice between common-user and special-purpose networks, network use for message systems, impact of new technology on data communications, techniques in data communications security; satellite system technology and diagnosis and repair.

Authors are asked to submit four copies of a complete paper and a 500-word summary by March 15 to Frank E. Heart, Bolt Beranek and Newman, Inc., 50 Moulton St., Cambridge, Mass. 02138.

THIRD INTERNATIONAL CONFERENCE ON VERY LARGE DATA BASES, Oct. 6-8, Tokyo, Japan.

Papers relevant to the following areas are solicited: data base design, data base system architecture, data base system analysis and evaluation and large-scale data base applications. Specific topics of interest include data base machines, distributed systems, structuring and restructuring, performance evaluation, access control, concurrent access, integrity and recovery, user interfaces, data base languages and very intelligent data base systems.

Five copies of each full paper should be sent by April 15 to Prof. Alan Merten, School of Business Administration, University of Michigan, Ann Arbor, Mich. 48109.

50th IEEE COMPUTER SOCIETY INTERNATIONAL CONFERENCE (COMPCON '77), Sept. 6-9, Washington, D.C.

Papers are invited on "Micros, Minis & Maxis — Technology Thrust vs. User Requirement" and specifically on the development and applications of microprocessors, distributed processing; development and support of software; peripherals, system technology, real-time systems, component technology; memories, and computer applications.

Submit four copies of a 1,000-word informal digest by April 1 to Paul Skartveldt, Program Chairman, TRW Energy Systems Planning Division, Bldg. W1, Room 3426, 7600 Colshire Drive, McLean, Va. 22101.

FIRST INTERNATIONAL COMPUTER SOFTWARE AND APPLICATIONS CONFERENCE (COMPSAC '77), Nov. 8-11. Site to be announced.

Papers are invited on the following topics: development methodology, management, data base management systems, transaction and information management systems, real-time applications, computerized decision-making systems, data communications and computer networking, case studies, computer-aided design, simulation, software tools, mini/micro software development, social and regulatory issues and organizational impact.

Submit five copies by June 1 to Dr. Dick Simmons, Director, DP Center, Texas A&M University, College Station, Texas 77843.

INTERNATIONAL FEDERATION OF AUTOMTIC CONTROL WORKSHOP ON INFORMATION AND SYSTEMS, Oct 25-27, Compiegne, France.

Technical papers dealing with research, planning and the state of the art with relation to recent results in the development and application of information in the area of systems. Papers may be in either English or French.

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Report Urges Message System

Enter Electronic Age or Face Exit, Post Office Warned

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Time is running out for the U.S. Postal Service. Without electronic services to supplement or replace the physical handling of first-class mail, the postal system could become obsolete.

This dismal prediction by the National Academy of Science's National Research Council (NRC), contained in a study commissioned by the Postal Service, was presented to the Commission on Postal Service at hearings conducted here last week.

If electronic transfer does not become part of the Postal Service's business, and thus its salvation, new technologies will simply provide further opportunities for commercial enterprises to further outstrip the Postal Service, Dr. Louis T. Rader, chairman of the U.S. Postal Service support panel of the NRC's Committee on Telecommunications, told the commission.

Charged by Congress in late September to make recommendations on the Postal Service's future by March 15, the commission is well aware of the urgency expressed in the NRC study.

Its members are not so sure about the American Public's awareness of the problems confronting the postal system. Accordingly, the post office's problems will be aired in 20 cities during a three-week period this month.

The Post Office Department, which was abolished by Congress in 1970 and reorganized the following year as an independent establishment, was committed to increasing efficiency and improving service. It planned to be financially self-sustaining by 1984.

Centralized mail processing, express mail and the Mailgram were introduced with these goals in mind, the NRC said.

But "despite these actions — and three first-class rate increases since 1971 — the Postal Service, after breaking even in 1972, has suffered rising deficits, with costs exceeding revenues plus appropriations from Congress," the study stated.

In fiscal 1976, the service operated at a deficit of $1.2 billion.

In addition, the demand for mail declined in 1975. "The alternatives such as the telephone, Telex, private parcel delivery, a sophisticated variety of facsimile, data and communications services and carrier systems for magazines, utility bills and product samples" were cited along with higher postal rates and recession and inflation as reasons for the dip in mail volume.

Problem Solving

To combat these problems, the Postal Service should expand into the new technologies that are now supplanting traditional postal services, the study said. In particular, the report suggested electronic systems that have the potential of providing message and data communications and banking transactions.

The Postal Service could develop ventures with communications carriers, information-processing services and users while, at the same time, capitalizing on its existing organization and other strengths, NRC suggested.

What kind of electronic message system could save the U.S. Postal Service? Who would have the authority to develop it and implement it? Why does the Postal Service need one, anyway? What are other countries doing in this area? See stories on pages 10, 11, 12 and 14.

As an alternative, the post office could provide its own electronic services to improve mail collection, transmission, distribution and delivery systems.

However, the Postal Service would have to realize this option could spark policy and competition disputes with communications carriers, the report added.

The Postal Service has been aware of the possibilities of electronic message technology, NRC said, but noted it "was somewhat surprised" that the reports on the subject by General Dynamics Corp., Arthur D. Little, Inc. and Philco-Ford Corp. "made such little impact" on the Postal Service.

NRC is particularly concerned since its conclusions follow the same general lines of these studies, it explained.

If the decision is made to go into the electronic message field, success will depend on the Postal Service's top management adopting the kind of conviction exhibited by those who managed the manned space program in the '60s, the NRC panel said.

Preyer Named Head Of Key Privacy Unit

WASHINGTON, D.C. — Rep. Richardson Preyer, a Democrat from North Carolina, will chair a key privacy subcommittee in the U.S. House of Representatives.

Preyer will head the House Subcommittee on Government Information and Individual Rights, a position left vacant after Rep. Bella S. Abzug left the House to try for the Democratic nomination in New York State's U.S. Senate race last fall.

Leadership for the Senate Subcommittee on Constitutional Rights, long regarded as the fountainhead of legislation protecting privacy, remains in doubt, however. Another week is likely to pass before the Senate Government Operations Committee selects a successor to John Tunney (D-Calif.), who was defeated in the November elections, a subcommittee spokesman said.

Preyer, 58, is beginning his fifth term in the House and has served on its Government Operations Committee for two years. He joined this committee just after the Privacy Act of 1974 was passed and so did not deal with this legislation at the subcommittee or committee levels, a spokesman in his office stated.

As chairman, Preyer will oversee the Subcommittee's assessment of the Privacy Act's effectiveness since it became law. Harings are expected in this area during the 95th Congress, the aide added.

The House Subcommittee on Government Information and Individual Rights will also examine the Federal government's ability to turn out unclassified information under the Freedom of Information Act.

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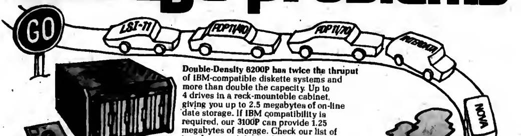

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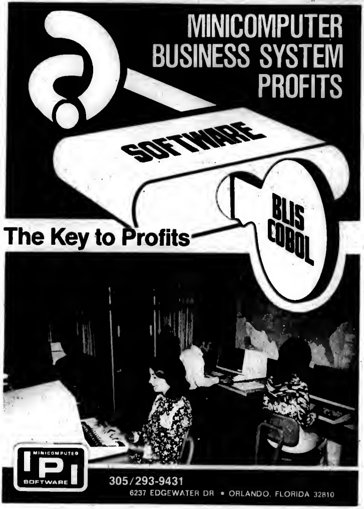

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NCR Suggests Three-Step Entry Into Electronic Message System

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — What kind of electronic message system could save the U.S. Postal Service?

The National Research Council (NRC) recommended three generations of systems at hearings before the Commission on Postal Service here recently.

Spotlight on the Postal Service

The Postal Service would probably operate elements of all three systems at one time, but changes from one generation to the next would be evolutionary, according to the NRC study, which was requested by the Postal Service.

Generation I would be an extension of today's system for first-class mail. Everything would still be handled physically except for selected links between postal installations.

Electronic transmission of information would replace the physical transport of mail between these links, the report said.

The Mailgram is an example of Generation II, which would call for electronic input and transmission of information, Hard copy would be produced at a postal installation near the recipient and then delivered by a postal carrier.

Generation III would be completely electronic, with a hard copy produced only if required. Information would flow from the message originator to its recipient in electronic form and carriers would no longer deliver letters, the study stated.

Two main elements would be required before Generation III could operate widely, the NRC panel said.

One is the development of an economical, reliable and reasonably compact terminal for the individual user. The other is utilization of existing distribution networks or the development of a new net.

Between them, business and government generate about 80% of the nation's letters. The panel estimated 30% of this mail is amenable to transmission as electronic messages and could be handled in a Generation II system.

The average household, however, receives only about six pieces of first-class mail per week. Because this amount is so small, it is doubtful a family would install a terminal to receive electronic messages unless it could be used for other applications as well.

The technologies needed for an electronic message system like Generation III, however, are already available or are in development, the study said.

While the study stressed the post office should manage the entire system, it added the Postal Service need not own or operate a complete message system.

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Electronic Mail Seen Infringing on Common Carriers

By Edith Holmes
Of the CW Staff

Spotlight on the Postal Service

WASHINGTON, D.C.— Does the U.S. Postal Service have the authority to develop any form of electronic mail?

According to the 1970 Postal Reorganization Act, the answer is yes, because new technologies such as electronic communications would increase the public benefit derived from the mail service.

However, the Communications Act of 1934 discourages this form of innovution by the Postal Service because it would infringe upon the services currently provided by such common carriers as AT&T, RCA and Western Union.

Congress must adopt a clear policy on electronic message services that best serve the nation and soon, according to a National Academy of Sciences report.

On March 15 Congress expects to hear from the Commission on Postal Service mandated late last fall to make recommendations on the future of the financially troubled U.S. mail operation. Those recommendations will probably urge some move into electronic communications.

Blurring of Services

For most countries, electronic communications is a government monopoly like the postal service. In the U.S., by contrust, it is a matter of national policy that all electronic communications except those under military jurisdiction are left to private enterprise, the study conducted by the academy's National Research Council (NRC) said.

If the Postal Service moves to a fully electronic message system the historic distinction between the mail and the service rendered by the communications common carriers will be blurred, the report added.

The argument that the physical letter reduced to some form of electronic coding is no longer mail was used in the 1840s and again after World War I to prevent the post office from gaining control of electronic communications, the study noted.

But when the old Post Office Department was removed from the executive branch in 1970 and made an independent organization known as the U.S. Postal Service, it acquired powers through legislation that argue forcefully for its involvement in the development of electronic message systems.

Mandate for Modernization

The NRC report suggested the Postal Service can use that mandate to maintain electronic message services that are a modern and efficient way to accomplish its mission.

Significantly, the Postal Service can point to its present use of mechanization and electronics and its experimental facsimile mail program. There has been no outcry from Congress, the public or the press against the use of such technology to improve the muil service, the NRC report noted.

But these systems involve a hard-copy output for the recipient and so can be said to fulfill the physical definition of a letter or mail. In an all-electronic system where hard copies may or may not be produced, it can be argued that there is no mail in the traditional sense of the word and that the Postal Service should not be involved, the study noted.

Full-Circle Argument

The argument has come full circle. While the courts may dabble in the issue of what constitutes mail, they are likely to leave the national policy and business competition issues raised by electronic message services up to Congress, the NRC study concluded.

Congress would need to study any Postal Service efforts to develop an electronic message system in addition to its interface with the services offered by the common carriers hefore setting nationul policy regarding electronic message systems in concrete, the report suggested.

If the Postal Service is successful in handling hybrid electronic systems thut involve hard-copy inputs or outputs, then Congress, business and the public will be more likely to support the development of a completely electronic postal system.

Question of Regulation

What body will regulate the Postal Service if the nation's mail becomes electronic communications? Whether the service implements an electronic system alone or in conjunction with networks already established by the common carriers, the Federal Communications Commission (FCC) will exercise an indirect regulatory control, the NRC study indicated.

Created by the Communications Act of 1934 to regulate all interstate electronic communications, the FCC has no present jurisdiction over the Postal Service. But it does regulute Western Union — the carrier the Postal Service now uses in Mailgram and Faxgram.

Ad Hoc Policy

The authority of the Postal Rate Commission to act in matters concerning electronic messages will also be uncertain if the distinction between the postal and common carrier services grows increasingly unclear, the report pointed out.

If the Postal Service does decide to go the electronic route, policy and regulatory issues will probably be considered on an ad hoc basis as they arise, the study said.

Recognizing the conflict between the Communications Act of 1934 and the 1970 Postal Reorganizution Act, however, Congress might seek to enact clarifying legislation now, the NRC said.

HIS Again Settles Suit Out of Court With User

WALTHAM, Mass.— With the recent settlement between Honeywell Information Systems, Inc. (HIS) and Colorado Hospital Services (CHS), HIS appears to be compiling a track record for settling suits out of court.

The settlement with CHS was made on "mutually agreeuble terms." HIS had brought a $35.3 million suit against CHS charging breach of contract and CHS had countersued for $39.85 million alleging breach of contract, fraud, negligence and misrepresentution [CW, Feb. 9].

HIS earlier settled out of court with Integrated Computer Services, Inc. [CW, May 24] in a dispute centering on HIS' right to discriminate among users of its equipment.

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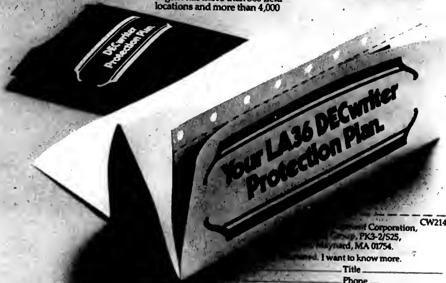
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Post Office History Seen Echo Of Changes in Communications

By Edith Holmes
Of the CW Staff

Spotlight on the Postal Service

WASHINGTON, D.C. — In 1845, Congress moved to legislate the continued monopoly of the post office because it was suffering from competition by private letter carriers.

In 1977, Congress is again concerned about the postal monopoly, this time because electronic communications threaten the economic viability of traditional first-class mail.

Then as now, the post office was an enforced monopoly, according to a Department of Commerce Office of Telecommunications report released here recently.

Entitled "The Postal Crisis: The Postal Function as a Communications Service," the report was submitted to the Commission on Postal Service, a team established by Congress to study the problems of and recommend a future for the U.S. mail system.

But unlike its position in 1845, when the post office was the only means of long-distance communication, the U.S. Postal Service of 1977 is just "one character in the modern cast of communications services," the report said.

Written by Donald R. Ewing and Roger K. Salamon, who work with the Policy Research Division of the Office of Telecommunications Policy, the report contended the Postal Service's present fiscal crisis "is but a symptom of a broader issue — the changing nature of communications in America."

The introduction of new technologies — telegraph, telephone, radio, television and digital networks — has put pressure on the older Postal Service to adjust, the study suggested.

In 1845, when Congress decided that the post office couldn't compete economically with private carriers, that service should be provided to unprofitable rural areas and that losses for frontier routes were to be subsidized with profits from more populated routes, other means of exchanging messages over long distances did not exist, the study said.

Though operational in 1844, the telegraph was still "experimental," and telegrams weren't sent until 1864. The telephone didn't appear until 1876 and the radio wasn't introduced until after the turn of the century, the report noted.

By 1926, however, the country sent more messages by telephone than by letters; today, 80% of the nation's personal and business messages are carried by telephone, the report said, quoting U.S. Census Bureau figures for 1976.

The telephone continues to slow the growth of the mail service. Business Communications Co., Inc. estimated phone calls reduced mail volume by 2.4 billion pieces in 1975.

But the need to deliver letters physically is now threatened from another quarter: the use of electronic communications to conduct personal, business and government financial transactions.

Since 40% of all first-class mail is financial transactions, this latest inroad on Postal Service business is a serious one, the study suggested.

"For the first 200 years of the nation's development, it was perhaps adequate to analyze the postal and electronic communications industries as independent entities. This will no longer suffice," the study stressed.

Another study, conducted by the National Research Council (NRC) at the request of the U.S. Postal Service, was also submitted to the Commission on Postal Service.

That study pointed out "this is not the first time that the question of involvement in electronic communications has been raised for the nation's mail service.

"In 1844, when Samuel F.B. Morse was transmitting news of the Democratic Party Convention in Baltimore to newspapers in Washington, the Postmaster General and some members of Congress urged that the Post Office Department assume ownership of all telegraph technology in the U.S.," the NRC study said.

In another instance, during World War I, all telegraph and telephone services were placed under the Postmaster General to meet the emergency, the study added.

"After the war, the post office recommended keeping the system as a government operation.

"In response to outcries from the business community and the press, however, the telegraph and telephone were returned to private operation," it noted.

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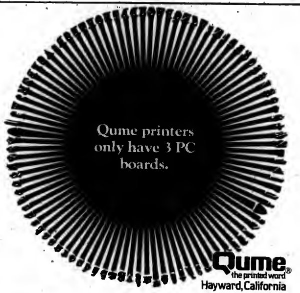
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Other Countries Moving Faster Toward Electronic Mail Service

By Edith Holmes
Of the CW Staff

Spotlight on the Postal Service

WASHINGTON, D.C. — Research conducted by other countries suggests today's methods of processing mail can be significantly supplemented or replaced by electronic message services, according to a National Academy of Sciences study completed on behalf of the U.S. Postal Service.

Canada, the UK, West Germany and Japan are all moving toward the development and introduction of electronic mail, the report, compiled by the academy's National Research Council (NRC) said.

Presented here recently to the Commission on Postal Service, the report also concluded that present and planned international telecommunications systems are capable of accommodating all foreseen requirements for electronic transmission.

The commission was created by Congress last fall to study and recommend plans for the U.S. Postal Service's future operations.

The Canada Post is constrained by legislation dating back to 1880 to consider only those electronic mail systems that result in a hard copy for delivery by a letter carrier.

The Canadians have designed a nationwide electronic mail system which will satisfy this guideline, the report said. The system will consist of 26 concentration and switching centers and cost $75 million.

A survey of potential high-volume users of an electronic mail system by the Canada Post ' Marketing Department ' indicated those users would have have several difficulties with such a system.

Concerns include the absence of corporate logos and graphics, the inability to enclose inserts and addressed return envelopes and need for security, when financial transactions are involved, the study noted.

British Post Office

The British Post Office currently operates both postal and telecommunications services and plans to use its telecommunications facilities to transmit mail electronically.

The NRC report pointed out that the UK has been running a Postfax system that provides facsimile service at the rate of 6 min/page between 24 selected locations.

But Postfax usage has been disappointingly low, the study noted, adding the British Post Office attributed the lack of interest in this service to too little publicity and the relatively good service provided by the regular mail.

The British have two additional systems under way: Giro, a postal banking service which is widely available for transferring funds and could easily lead the post office into-electronic funds transfer systems, and Viewdata, a visual communications system that employs an ordinary television receiver with an adapter and existing telephone lines connected to a data center.

West Germany's Bundespost

The report also took a look at the Federal Repuhlic of Germany.

Like the British Post Office, Bundespost planners contend the development of electronic mail is handicapped by the next-day delivery of conventional domestic letter.

The West Germans estimated about 22% of their current mail volume could be carried electronically, the report stated.

But although current mail service is judged good, costs are rising and volume is dropping. Telegram traffic has also fallen off, the study said.

And The Bundespost has also found the Giro banking system works and is growing at a rate of 16% each year.

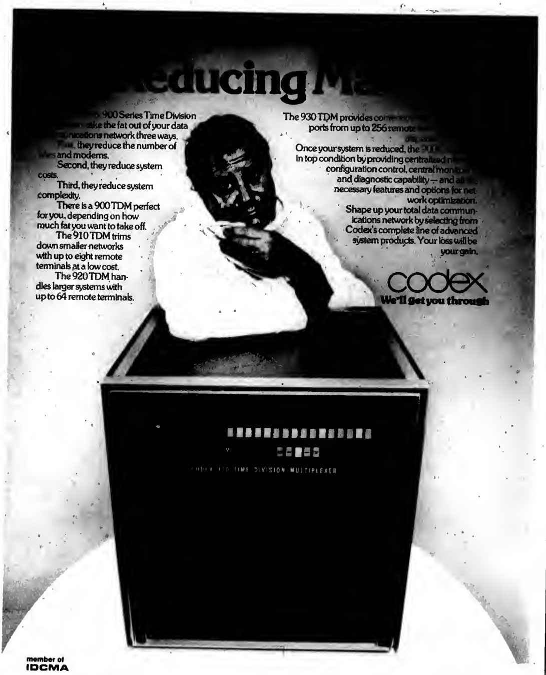
The Federal Ministry of Posts and Telecommunications in Bonn has determined that electronic mail can be achieved with present technology, but noted that terminals need to be developed further.

Even the commercial enterprises that have conducted studies of the potential for electronic mail in West Germany, overall a more optomistic lot, envision complete electronic delivery for business organizations only, the study reported.

Japan will reportedly introduce a system that provides electronic transmission of messages between major postal facilities. The Japanese system is said to use low-cost, readily available facsimile equipment, the report stated.

Its first user will be the Japanese government, followed by business and then the public if the service is deemed successful.

Japan is also interested in establishing a service similar to the Mailgram and has dispatched several managers and engineers to the U.S. to study the operation here.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N.Y. Problem Corrected

Vanity Plates Bugaboo to CPU

By Esther Surden
Of the CW Staff

NEW YORK — Improperly defined computer files may have been the reason some out-of-state motorists received summonses from New York City to pay parking tickets they never got.

Several New Hampshire residents received the summonses with orders to report to court even though they had not been in New York City for many years, according to Ira Royer, one of the victims.

Royer was accused of owing the city $800, but has since been cleared of charges.

The problem involved the three-character "vanity" plates some car owners purchase with their initials or first name on them, according to Harry W. Voccola, director of New York's Parking Violations Bureau. Royer, for example, had a plate marked "IRA."

Since New Hampshire issues more than one plate with the same letters on them, the plates are distinguished by the presence, absence or location of hyphens, he said.

Originally, only New York State tag numbers were stored in the IBM 370/158 at Bradford National Clearing Corp., a contractor who handles the city's parking violation work, Voccola explained. Recently, however, the data bank was expanded to include plates from most northeastern states.

Since New York does not use the hyphen placement method of distinguishing between vanity plates, no provisions were made in the files for different plates with the same letters, he said.

Voccola emphasized the problem may not have been computer-related; officers on the beat, not realizing the dashes made a difference to the New Hampshire plates, may have omitted them when copying the initials.

But even if an officer had been diligent and copied every marking, there would have been no way for this information to be entered into the system, he said.

The problem has been resolved, Voccola noted, and the system can now accept the hyphenuted data. And there still is someone in New Hampshire with "IRA" on a vanity plate who owes the city $800, he added.

"In fact, as we mail summonses to the states, more and more of the drivers crop up with a New York address," he said.

Voccola said the city's parking violation error rate now is about .012%.

Matching Service Set To Reunite Adoptees, Biological Parents

EVANSTON, Ill. — Adult adoptees and parents who have given up children for adoption may soon be reunited through a computerized matching service called the National Adoption Registry.

Donna Cullom, head of Yesterday's Children, an organization aimed at helping adoptees and biological parents find each other, previously reunited nearly 400 children and parents through "pure detective work."

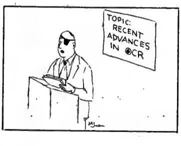
Then, after discovering two cases in which she was able to reunite a parent and child by simply looking through Yesterday Children's membership files, Cullom decided a matching service would work better. However, she realized a computer would be needed to compare the files of the group's 6,000 to 7,000 registrants.

The program design and computer time were donated to Yesterday's Children by a local business. Twice a month, the registrants' names, birthdates, sex, region of birth, name of hospital, doctor and the agency who placed the child will be keypunched and entered into the donated IBM 360 equipment, Cullom said.

First scheduled to be run in January, the service was postponed a month bcause of the continued growth in the number of applicants, according to Cullom.

The chances of matches on the first computer run are slim, however, since there are still millions of adoptees and biological paents not listed in the service, she noted.

The National Adoption Registry can be contacted at P.O. Box 1554, Evanston, Ill. 60204.



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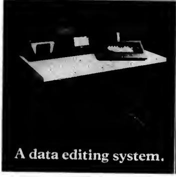
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Project Aims to Classify, Store Endangered Plant Species Data

By Esther Surden
Of the CW Staff

NOTRE DAME, Ind. — The answer to the question, "where have all the flowers gone?" may be imminent if plant data bases, such as the one here at the University of Notre Dame, bloom.

Begun under the auspices of a National Science Foundation grant, this project aims to classify and store information on 100 to 200 species of the mustard family. The information is taken from about 35,000 specimens.

As impractical as it may sound, the project has a useful application, according to Theodore Crovello, chairman of, the biology department and project director.

In 1973, a federal law was passed that required contractors who were beginning to develop land to determine first whether any endangered plants or animals occupied those lands, Crovello explained.

Before the development of this kind of data base, the information was scattered and there was no way for a developer to determine if a species on the property was near extinction, Crovello stated.

The 35,000 specimens come from information stored in herbarium and various university depositories. Although herbariums keep and label the specimens they protect, the information on each has not been cross referenced nor does one depository know what the other has, he explained.

In particular, scientists could not find out if more of a certain mustard plant species existed in a county in 1952 than today.

The university is the "first to inventory specimen holdings in many of the museums," he continued.

Information is stored on the college's IBM 370/158. The data is either gathered from labels or from documented literature and then keypunched.

Digitizers are used to input morphological or structural measurements into the mainframe, Crovello noted, because this accelerates the data capture.

Trends Suggested

The output is a county-by-time table, listing the number of specimen anyone has collected and deposited at any time. This suggests certain trends toward proliferation or extinction and allows researchers to spot species on the way toward extinction in a particular area.

So far, the project includes contributions from about 75 institutions including the University of California at Berkeley and Harvard University:

DP-Aided Tax Agents Save Citizen Money

By Ann Dooley
Of the CW Staff

SAN DIEGO, — Tax collectors, long a maligned group, have shed their Snydley Whiplash image and are saving money for taxpayers here by auditing the property tax roll with computers.

Using two county IBM systems — a 370/158 and a 370/145, plus communication terminals, on-line CRTs and an IBM 3350 disk system — the county collector's office computes the tax returns overnight in a batch process run twice a year, according to Paul Boland, administrative assistant to the county tax collector.

The system works by comparing tax returns with data from the county assessor's office. Payment is returned with a tax stub which is processed through a scanner and put on magnetic tape. If a stub is not returned with the payment, then the total must be keypunched and verified.

The computer checks for any variations in the amount paid by the taxpayer, compared with the amount indicated by the assessor's records. The records are then updated and stored on disk.

The county processes 500,000 real estate taxes twice a year and 60,000 other taxes yearly, Boland said.

The task of collecting $531 million in taxes is running more smoothly now, according to James E. Jones, tax collector.

"We used to have big sheets of tax records covering our offices when the deadline approached," Jones said. "Our employees had to pore over those rolls and mark with a rubber stamp to check off people who had paid.

"An additional benefit was that we saved a good bit of money in labor costs."

Check handling has not been automated yet, although the county would like to do so, Boland said. Scanning the actual check would be a more efficient process than adding them together manually as is done now, he noted.

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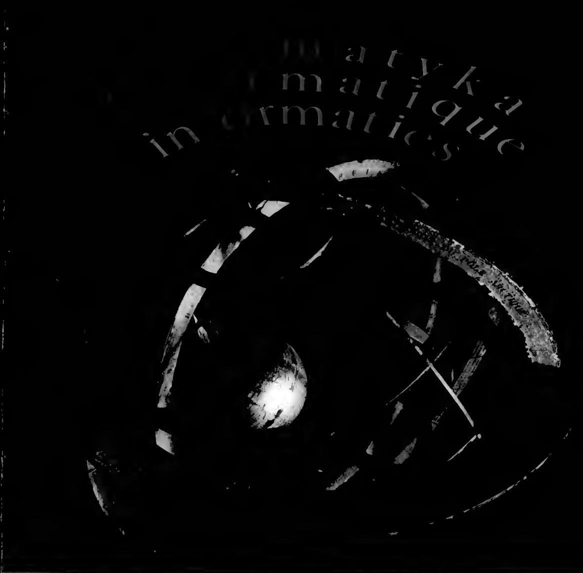

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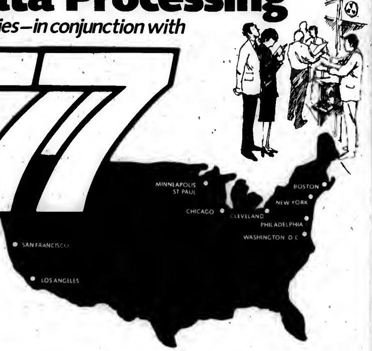

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Do it now.

System Pinpoints Patients With Pulmonary Problems

By Ann Dooley
Of the CW Staff

HOUSTON — The patient is told to take two aspirin, drink plenty of fluids and access the terminal in the morning.

Unlikely? Yes. Nevertheless, the medical profession is increasingly turning to DP for more effective means of diagnosis and treatment.

Now doctors treating heart and lung diseases can obtain advice from Methodist Hospital's computer system here to evaluate a patient's heart and lung condition.

Methodist's computer, an IBM 360/65 running under the CICS environment, is programmed with heart and lung data for healthy persons of various physical types and conditions. Statistics on age, weight, medical history and other pertinent facts are kept on-line in the data bank for comparison with input data on a particular patient.

To diagnose a patient, physicians put him through a number of standard procedures which determine inhalation/exhalation capacity, according to R.E. Wimberley, DP director. The patient's performance is rated and input via a dial-up terminal in a conversational interactive mode, he said.

The system will compare those results with a person of similar characteristics but normal pulmonary activity. After comparison, the system will ask for additional testing, if necessary, or recommend therapy for the patient.

Pulmonary rate variations between the patient and the prototype are output in three forms, Wimberley said. One form includes computational figures on pulmonary rates.

The second is an air-flow volume diagram consisting of graph curves plotted to reproduce flow of air to lung cavities over time and a comparison with the norm.

The third format is a written English summary of the patient's condition, Wimberley said.

The program took five years of medical research to complete and is currently accessed remotely by 18 other hospitals, Wimberly said.

The system provides greater objectivity, according to William J. Blevins, technical director of the program.

"You have a standardized format and objective criteria with which to evaluate the data. For the same set of data, you're not going to get three or four different evaluations," he said.

Review by CPU Ensures Patients Not Overcharged

KANSAS CITY, Mo. — The staff at St. Luke's Hospital here treats patients and also makes sure their hospital bills are in the best of health using u computerized bill-verification system.

"There is always a problem in collecting the right charge because the different departments might not generate the right amount or their bills never reach the business office at all," according to Thomas C. Simmons, director of management services.

A typical hospital loses 10% to 15% in medical charges annually, "which is what finally made us go to a computerized system," Simmons said.

"We make sure patients pay only for charges they actualy incur. We check for errors and omissions before a patient receives his final bill so he knows exactly what he owes," he explained.

Key to the Program

The key to the program is the patient's medical record which inindicates all services performed, he said.

Registered nurses in the business office review each patient's record and divide it into different billable services. These services are coded, keypunched and then processed on an IBM 370/145.

A master list of billable services and supplies needed for each medical procedure is stored in the CPU, which generates all charges associated with each procedure.

The system compares a patient's bill with the master list of charges to make sure the two totals correspond. Errors and omissions are reviewed by the hospital business staff before the final bill is processed.

"As a result of the system, more than $1 million in adjustments to patient bills have been made since the computer review system began in 1974," according to Charles C. Lindstrom, executive vice-president of the hospital.

"The volume of services performed requires a strong system of management control to ensure accuracy, and now we can spot any errors and correct them immediately," Simmons added.

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Mini Takes Picture of Heart While Patient Exercises

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Scientists here have developed a method of taking computer-constructed pictures of the heart while a patient exercises.

Older techniques for taking internal heart pictures don't generally permit the patient to move, let alone exercise, and researchers at the National Institutes of Health (NIH) maintain the new procedure is both easier and safer.

But while less painful and capable of revealing problems not readily evident when the patient's heart is at rest, the technique probably won't replace the traditional forms of angiography, as X-raying the inside of the heart is called.

The method very well may supplement the standard techniques, however, which call for an incision into an artery in the arm or leg through which a tube is pushed along the vessel and into the chambers of the heart, the researchers said.

With traditional angiography, either a contrast dye is put into the heart through the tube and X-ray pictures are taken or a radioactive isotope is used instead of dye and images are made from the radioactive emissions.

The computerized method requires that a protein containing a small amount of a short-lived radioactive isotope be injected into almost any vein of the patient, the scientists explained.

Within minutes, an instrument that measures radioactivity is attached to the left side of the patient's chest that picks up the passage of the isotope through the heart and feeds its readings to a minicomputer system.

Michael V. Green, a physicist with NIH's clinical center and one of three men who developed the method, said the computer system registers each point of radioactivity in the heart every 10 thousandth of a second and builds a three-dimensional picture that appears on a display screen.

The display projects a "movie" of the heart when these separate pictures are played one after another, according to Dr. Jeffrey S. Borer, a senior cardiology scientist at the National Heart, Lung and Blood Institute.

Dr. Stephen L. Bacharach, also with NIH's clinical center, worked with Green and Borer to create this form of angiography. Bacharach is responsible for programming the real-time system that constructs movies during data acquisition.

With this technique, a patient lying on his back can pedal a bicycle-like device and his exercising heart can be studied.

The older forms of angiography don't permit such activity because the tube used to inject the dye or radioactive isotope is actually in place inside the heart and might cause damage if it is moved, Green explained.

He added, however, that the computerized technique doesn't provide the wide range of information that the older methods are capable of obtaining. For example, the new method doesn't measure pressures in the heart.

Because angiography is generally performed in a clinical setting — at the patient's bedside or in a hospital operating room — a minicomputer is a more reasonably sized instrument for the task than a larger mainframe would be, Green suggested.

His team uses a Hewlett-Packard (HP) 5407 scintigraphic data analyzer for nuclear medicine. This system is composed of an HP 2100 mini, a nuclear medical display, a teletypewriter and magnetic tape drives.

Other researchers — particularly Bertrum Pitt and William Strauss at Johns Hopkins University — are doing similar work, Green stated, and benefits of the technique are still being evaluated.

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Editorials

National Policy Needed

In one of its last acts, the outgoing Ford Administration released a report calling for a national information policy — and that recommendation should not be ignored by the incoming Carter Administration.

Today there are hundreds of organizations within the government that deal with information policy. Those efforts are fragmented, wasteful of resources, overlapping and often contradictory.

And outside of the government, there are even more pressure groups, lobbies, private firms and individual citizens that affect or are affected by these fragmented policy decisions.

As the report noted, one-third to one-half of the gross national product is derived from the production of information and knowledge [CW, Feb. 7]. The U.S. has definitely entered the "information age."

But everyone concerned is dealing with the problems spawned by the advent of this age on only an ad hoc or piecemeal basis. There is no broad overview of the field.

Decisions made by one of these ad hoc groups often affect the activities of other groups — without a broad overview, chaos reigns as decisions made by one group have a cascading effect on others.

Too often reports of an outgoing administration are ignored or put aside by the new group. But the time for study of these issues is over, and the Carter Administration has a golden opportunity for action in this area.

President Carter has often expressed his wish to streamline government and make it more responsive to the people.

By creating an interagency council on information policy and melding into it many of the presently competing or overlapping agencies, commissions and boards, he can begin this process.

Making sense out of the often conflicting regulations presently affecting information users and disseminators will be no easy task.

An outgoing governmental body has given a blueprint for getting started on the task. It is now up to the new government to begin the work.

Remember and Reassess

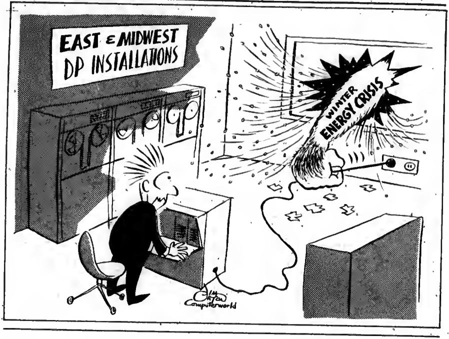
The Sabre system developed by American Airlines and IBM deserves its place in the Smithsonian institution as a technological achievement — it was, after all, the first national reservations system and a demonstration of what computer technology could do.

But along with that achievement, the side effects of the system, expressed so well by Beryl Simpson in Studs Terkel's *Working*, should not be forgotten [CW, Feb. 7].

In those days of the early 1960s — and still more often than we like to remember today — the system was all-important and the people who had to work with it were given little consideration.

People had to be regimented to meet the requirements of the system — they were and are thought of as extensions of the computer, not as individuals.

So while it is time to remember and to honor the technological achievements of the computer age, it is also time to reassess the effects of those achievements and to work harder at humanizing systems rather than computerizing people.



Letters to The Editor

Unsolicited Negotiable Documents Shouldn't Be Sent Through Mail

As one who has suffered at the hands of the U.S. Postal Service, my experiences of the real world are somewhat different from those expressed in the letter from Jerry Gitomer ["Solution Rests in Real World," CW, Jan. 24].

My advice to anyone sending unsolicited negotiable instruments through the mail is brief: Don't!

American Express has, it seems to me, an excellent solution for sending charge cards to its members. The original letter, containing the new card, is followed up with a form for notification in the event of nonreceipt of the card.

Thus, if one of the letters goes astray, there is still a reasonable certainty of the other being either forwarded or returned.

In addition, the importance of the letters' contents is not exposed because no special markings are needed.

David De Jongh

Ocean Springs, Miss.

Job and Pay Aspirations Differ

Andrew Robinson stated he wished to remain a computer operator, "but not lose the financial gains afforded to an applications programmer". ["DP Industry's Youth No Excuse for Its Hiring Practices," CW, Jan. 24].

"What should I do?" he asked. Well, I for one would like to tell him.

He gets "Maggie's drawers" for completely missing his mark; he wove himself a web of dilemma. With his announced abilities, he should be capable and willing to accept that hiring practices are not his obstacle; it is his untrained thinking.

Individual job requirements vary greatly and no job will demand the total offering of any applicant. In other words, one does not have to be able to cut hair to write a program, yet I'm sure there are some hired programmers who can cut a beautiful head of hair. Should that gifted person be paid as a barber or as a programmer?

Robinson must accept the concept of job hierarchy as being real; filling a job vacancy affects that job's hierarchic position, status and pay among other things. Herein lies Robinson's "just compensation for just performance."

If you, dear sir, want a programmer's pay, then accept your promotion. Both positions are honorable, as are all jobs, but please, don't expect a president's pay for sweeping floors. They are at opposite ends of job hierarchy and for good reaosns.

You'll be OK, Robinson; keep a stiff upper lip and understand now that job aspiration and pay aspiration are not necessarily one and the same.

Karl G. Gordon

Waterford, Pa.

Study Lacks Statistical Know-How

From my interpretation of Jack M. Wolfe's article ["Novice DP Majors Outscore Veteran DPers," Jan. 10], it appears he has very little knowledge of preparing a statistical study.

Wolfe rated a group of computer science majors with no actual work experience higher than programmers with actual programming experience. The findings may have been true if he had conducted the sample study using two equal groups of either 200 or 473 respectively. This would have been necessary to draw any worthwhile conclusion from this study. What about random sampling?

Wolfe's results were no indication that his sample size of DP majors will excel on the job. It is merely an indicator that this group may have the knowledge and tools to succeed.

T.J. Zarecki

Chicago, Ill.

Data Past

Five Years Ago
Feb. 16, 1972

WASHINGTON, D.C.— Plans to transmit computer-based criminal information by an experimental satellite were under consideration by the Federal Bureau of Investigation with the backing of the National Aeronautics and Space Administration. Another proposal to launch a satellite dedicated strictly to law enforcement uses was also considered.

The dedicated satellite, sources said, would carry all types of criminal information, from fingerprint facsimiles to data from the National Crime Information Center's computer center here, if the project was approved.

— — —

LOS ANGELES — Jerry Neal Schneider, the 21-year-old president of a Los Angeles communications equipment firm, was arrested for allegedly stealing nearly $1 million worth of Pacific Telephone Co. supplies by cracking the code for the company's computerized ordering system.

Eight Years Ago
Feb. 19, 1969

NEW YORK — The Guide-Share merger was killed here last week. Whether the vote went strongly against the proposal was not revealed.

Share and Guide, two user groups affiliated with IBM, revealed that antitrust cases against IBM were not thought to have seriously influenced the vote.

— — —

WASHINGTON, D.C. — The right of an individual to see his personal credit bureau record was part of the guidelines proposed by the Associated Credit Bureaus, Inc. (ACB) members, Rep. Cornelius E. Gallagher (D-N.J.) said.

An informed source believed the action by the ACB was taken in the light of congressional criticism of credit bureau practices.

Must Be Dynamic and Direct

Interactive Workshop Key to Training Top Executives

By Jack Stone
Special to Computerworld

My last column presented some thoughts on the training of the non-DP executive [CW, Feb. 7]. I suggested that the learning environment of this executive group, relative to training in effective decision making for the fourth-generation computing era, constrains the selection of instructional style to that of a dynamic, interactive management workshop, addressing problems of current interest to the enterprise chiefs.

Presentations held during such workshops must be very direct, brief, relevant, lucid, organized and immediate. Instructors must not only communicate the management principles involved in a highly articulate manner and properly moderate the cross-current discussions that always ensue, but must present themselves as the models of DP management expertise.

One measure of effectiveness of a DP manager, I believe, is his ability to design and implement such workshops for executives, addressing knotty issues that are crucial to executive decision making, including setting the long-range plan, establishing project priorities, structuring conversion programs, selecting multiple-vendor hardware configurations and designing information systems for computer center control.

I also believe those managers who can produce successful executive workshops have the capability and personal leadership to overcome, in their organization, the toughest problem facing the industry today — the relations between the top executives and DP management. (A rhetorical question for DP management readers: Can you handle such workshops?)

Case Study Presentation

I thought it would be useful to illustrate my views of the executive workshop by presenting a case study from my personal files.

This case involved a medium-sized manufacturing firm which was organized on a highly decentralized basis. The degree to which DP systems were automated was quite dependent on the DP expertise of the leaders of the individual operating divisions.

As a result, the level of automated DP was uneven across the corporation: in one division, DP was totally manual; another met its needs through an external service bureau; a third had an early third-generation machine installed which processed both its workload and that of the corporation and was viewed as the corporate central DP facility.

Recently, the corporate staff determined the DP environment within the corporation was not moving ahead properly: the central facility was approaching saturation, processing delays were increasing, dollar expenses were mounting and urgent system requirements were not being met.

In addition, the central staff learned of recent technological advances which suggested possibilities of reducing current costs and increasing operating efficiencies.

The corporate office decided to appoint an interdivisional task force to study ways of improving the current situation and developing an approach to a long-range corporate plan which really didn't exist.

Knowledge Too Limited

One of the first conclusions of the task force was that, although the executives were primarily from scientific and engineering backgrounds and had some familiarity with DP systems and technology, the front office had too limited a knowledge of the fourth-generation computer environment.

I was approached by the task force and asked to submit my ideas for a three-day program of appropriate technical training for its executive group. Since I only had limited information on the company at the time of the inquiry, I responded with the expected set of technical topics: systems concepts, equipment concepts, the sytems development process, programming concepts, management information systems and systems management.

New Approach Suggested

However, I emphasized that its executives would turn off quickly if this material were delivered in the conventional lecture approach. I suggested that technical presentations should be interspersed among interactive workshops which are devoted to the interpretation, application and significance of the technical material to the business of the corporation.

The Human Connection

Task Force

The task force representative expressed interest in the approach and invited me to his facility to discuss the program further. During my visit, I learned that the task force people had not yet experienced the joys of — well — installing and managing modern large-scale equipment and were lacking some of the experience required for a successful long-range planning effort.

Therefore, I felt that it would be inappropriate to provide any training to the executives prior to or at the same time as the task force.

I suggested, for the same budget, the following replacement program: I would conduct a four-day management training/consulting program for the task force, helping them to build the proposal to corporate for a long-range planning effort. This would be followed by a one-day program for the executives.

The task force training program, performed on nonsequential days, was a quasi on-line affair in which task force members conducted staff assignments, prepared documentation and suffered through my critiques of management, technical and communications qualities of their work.

When completed, the proposal covered such items as task force charter; user needs; current status of DP; projected configuration possibilities; and specific recommendations for conducting the planning effort, including costs, manpower and schedules.

Executive Program

The one-day program for the executives had two parts: workshop training in major factors that executives should consider in adopting a long-range corporate-wide DP plan and the presentation of the proposal to conduct a detailed long-range planning study by the task force.

I went on first and conducted an interactive workshop covering such subjects as review of modern DP technology, integrating DP plans with other corporate plans, setting objectives, committing resources, setting standards, performing evaluations, vendor relationships and controlling the DP organization.

The task force then presented its proposal, which was promptly adopted by the executive group.

A copy of the second of my curriculum guidelines, "Considerations in Effective Training of the DP Executive" is available by request on company letterhead. Please enclose a self-addressed stamped envelope.

Readers are invited to send letters to be answered in this column, as they pertain to management and human relations issues in the DP setting. Please address letters to Stone, Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007

New Look in Certification

Professional Recognition Emerging in Different Shape

The Taylor Report
By
Alan Taylor, CDP

Professional recognition in the DP field has been slow to take shape, for many reasons. Perhaps prime among the reasons is the fact that many bright people, without any apparent qualifications by way of training or experience, seemed to do good professional work. So what do you do about them?

Almost as baffling was how to handle the problem of what a DPer reasonably had to know. With the increasing specialization in the field and the availability of canned systems and software, there seemed to be very little that was a common requirement for all.

The earliest approach by the commercial managers group Data Processing Management Association (DPMA), took the view that experience on the job was a necessity for recognition. If you had lasted five years, the group reasoned, and had effective knowledge as well, then it was reasonable to recognize you. This laid down the shape of the Certificate in Data Processing (CDP), which at that time was under the DPMA.

Later, under the urgings of people inside and outside the DPMA, this requirement of experience was diluted to some extent by the recognition of university degrees and, for a short time, an unfortunate experiment to try to make them mandatory.

This situation was smoothed out when the consortium of professional societies took over the CDP from DPMA some years ago and set up the Institute for Certification of Computer Professionals (ICCP).

ICCP Operation

Under the ICCP operation, the CDP qualification has continued to require experience as well as knowledge. This experience, however, could be obtained after passing the examination, so the bright sparks who wanted to show their capabilities early could take and pass the examinations whenever they wanted.

This approach definitely aided matters by making it plain that the CDP was not an old-boys-only club.

However, it didn't really provide for everyone in the field; the old problem of specialists remained. At various times, there were approaches to having specialized examinations for different areas, but nothing really made the grade on the national front.

The New Look

Work was going on, however, and preparations are now far advanced for what appears to be the new look in certification. Details are still not firm, but the overall picture seems to be fixed.

Under the new look, subjects that are specialities, such as scientific programming, business programming or systems programming, receive separate recognition — without any requirement of experience. Where management is a part of the examination (as with the CDP itself), experience is to be continued as a requirement along with knowledge.

How many specialities will be recognized is not yet known. At first, probably only the three programming areas I have mentioned appear to be ready for recognition — and even this isn't official, so don't bank on them just yet.

Other areas will be coming later, particularly in the systems analysis and auditing areas. These will be very welcomed because in both areas recognition of competence is particularly hard and very important.

Interrelationships

The relationship between these specialty areas and the CDP itself is as much up in the air as it has ever been and the chances are that this will continue.

On the one hand, the specialists' examinations can be argued to be harder than the equivalent areas in the CDP examination and should, therefore, exempt their holders from having to pass both if they want to hold both specialist and the generalist CDP qualification.

On the other hand, there is so much more in the CDP examination than just specialty knowledge and the value of experience has its own unique importance.

Arguments as to which is "senior" are probably inevitable, but as I see it, intrinsically barren. The CDP seems certain to continue as the general, broad-based qualification including pretty solid mathematics, accounting and management areas.

None of the specialists' exams seem able to take its place, and we certainly want qualified generalists just as much as we want to recognize specialists.

So coexistence seems to be the order of the day — and the qualified guy who wants a managerial slot in a specialty will tend to try to get both the CDP and his recognition as a specialist. But that is just my guess and it could go other ways in the future for all I know.

Next Steps

The timing of this seems to be shaping up for a March announcement, followed quickly by the institution of the examinations. I know there will be quite a lot of attention paid to the first examinations. It is also quite possible that some of the member societies of the ICCP may run their own evaluations of the exams, which is for the good. These exams must be good and well managed if the work of the years and the various societies is not to be wasted.

I think everything will go OK in this area. If you are a professional in any of the programming areas (business, systems or scientific) for which a test will probably be offered immediately, it might not be a bad idea to schedule some study time, starting now, for your own, professional recognition as a specialist.

You don't have to join any particular society, although many of you may want to. All you have to do is study and know your subject.

Try it — you'll do yourself and your profession a service.

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Reader Commentary

The Outside User — Part 1

Renter of Time From Private User Gets Little in Return

By Mal Stiefel

Special to Computerworld

You think you've got troubles? Pity the poor outside user, the guy who rents computer time from private companies that have a little to sell; he gets nothing in return but heartache and aggravation.

He loses sleep, money and face simultaneously.

If a job is left overnight, it doesn't get run. If he comes in to run it himself, his time slot is from 4 a.m. to 5 a.m. unless he gets bumped.

Of course, as you might guess, it's the small user who is affected. The tiny service bureau, struggling to make a buck.

Don't worry about the solid, affluent citizens who have their own machines and are looking for backup or overload protection. They may have well-defined long-term computer time rental arrangements with other companies, usually close to home.

In a closely related situation, a company about to switch to a new system will look for a lot of outside time over a relatively short span, during or perhaps just before the conversion period.

Management in the seller's company supports such arrangements. The seller and buyer are happy. If there's a broker, he collects his 12.5% and he's happy.

Next week, in the last half of this series, the author will discuss alternatives for the outside user

The affluent buyer may pay a premium, but he'll get good service.

But the little guy makes a low-cost deal, perhaps with a minimum monthly usage guarantee. If the seller isn't interested in or capable of attaching importance to this relatively minor facet of his business, the outside user suffers.

From the Top Down

When upper management directs the DP manager to bring in outside users, the directive talks about chargeout rates, (around 1/200 of the monthly rental for a dedicated batch machine), but it doesn't mention the attitude the department should adopt toward the outside user. That's up to the DP manager, and he's anything but outsider-oriented.

Still, an order is an order. So the DP manager casually informs the operations manager that the company is going after the outside user. If any plan has been drawn up at this point, it's minimal.

Maybe ther's a revenue forecast, maybe not. Security? We'll worry about that later. Storage space for the outside users? Not considered. Work space? Manuals? Programming and keypunch support? Operator support?

These things aren't in the plan, because no one thinks of them.

What Services Offered?

Sometimes, when the rates are set, the seller isn't really sure what services are offered for the stated price. When the outside user asks about operator support, for example, the answer could be, "We'll work something out," whatever that means. Or, "Well, someone's got to be here to cover you anyway," which implies that whoever covers will also operate.

But no one tells the cover man/operator. So on the first day the user asks for help from the cover man, who is in his office reading the paper; the "operator" resents the intrusion.

A pattern of hostility and mistrust is set, which will last as long as the outside user's patience holds out.

Ultimately the user will give up, recover his belongings from behind the CPU (where they are thrown when he isn't there) and go elsewhere to begin the same frustrating cycle anew.

But even without a plan, if the seller can pretend that the outside user is a valued customer, rather than a pesty intruder, the relationship will improve for both parties.

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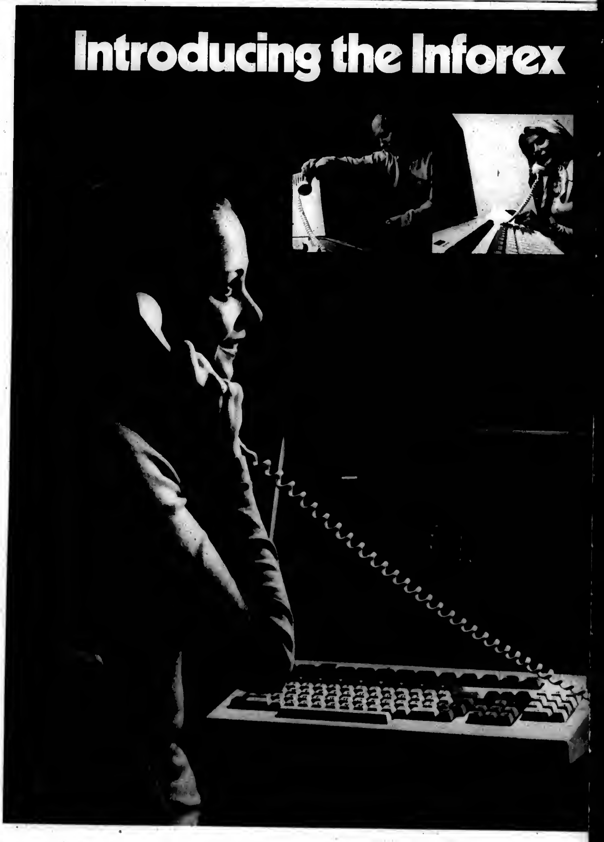

Tech Writers Need More Than Knowledge About DP

Reader Commentary

By Don Johnson
Special to Computerworld

Having been a documentation specialist for approximately six years and in DP for 10 years, perhaps I can provide a few comments from a practical point of view on the problems encountered in the technical writing field.

First, a good tech writer must analyze the needs of a given systems group. Remember, the members of the group don't know what tech writing is about; you, as a tech writer, should.

This is often difficult, for it is a matter of pure communication, something that has reared its ugly head many times in DP.

But this is not just a matter of communication, but also of cooperation. The tech writer must talk with the programmer, the systems analyst and the DP manager, not to mention the user.

The most frustrating item that I have encountered is the "I-Don't-Have-Time" syndrome. The personnel that a tech writer must deal with must be shown that if good, usable material is to be produced, key people must be willing to sacrifice some of their time.

The true tech writer must have high standards and a good, overall knowledge of DP and the people involved with it. The minimum standards should include:

- Programming. Reading a source listing without knowing how to program is like reading a Latin primer in the fourth grade.
- Systems. How else would one define a logic flow?
- Ability to communicate, especially with users. A user's manual does, after all, show the user how to utilize the computer, even if he doesn't know how it works.
- Artistic ability. Whether flowcharting a system or designing a form (such as a paycheck), the tech writer must maintain high standards of precise and neat form.

Although artistic ability is often not a criterion for a tech writer, who better than someone directly involved in both DP and the needs of a user should design source documents as well as computer forms?

Johnson is a technical writer in the DP department af the P&M Manufacturing Division af Dresser Industries, Inc. in Dallas.

Kitchen Focuses On Wrong Angle

By Herbert S. Bright
Special to Computerworld

James Kitchen's short tutorial, "Cryptography Urged as Practical Means of Security" [CW, Jan. 17], gave some excellent arguments for use of computational cryptography to strengthen the pathetic system locks that are in general use.

Unfortunately, the methods he suggested are from the precomputer era; they'd reduce the risk of accidental disclosure, but would not resist purposeful attack.

Modern methods emphasize secrecy of key rather than of algorithm.

Cryptographic protection can be gauged by three nonindependent measures:

- Key strength (length; unpredictability or randomness).
- Work factors (cost to encrypt/decrypt; cost to break).
- Extent to which protection is dependent on the secrecy of algorithms used.

Crypto methods may be designed to face three levels of attack.

- Ciphertext only (cryptopuzzle-class; yields to statistical attack; worthless for serious protection of computer information).
- Known-Plaintext (sufficient quantity of Plaintext and exactly corresponding Ciphertext to permit backtracking of key stream with weak algorithms).
- Chosen-Plaintext (attacker can use system to encrypt/decrypt any amount of any desired data; encryption key is accessible to system but not to attacker).

For commercial purposes, a simple measure of strength is the minimum amount of presumably undetected large-scale, general-purpose computer time needed by a skilled cryptanalyst to break a protection scheme.

Useful schemes could resist such attack for times ranging from less than an hour to billions of CPU hours. We see little excuse for using schemes having less than 1,000 hours' resistance; readily available 1,000-hour software schemes can operate at high speed.

Bright is with Camputation Planning, Inc. in Bethesda, Md.

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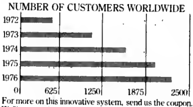

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Lord Called Not Knowledgeable About FAA System

Reader Commentary

The following commentary was submitted by Robert R. Jones, Maurice C. Loveland, James Billian, Wesley Norton and James Wible, who have designed air traffic control systems.

Special to Computerworld

We must take exception to Keniston W. Lord Jr.'s recent columns on the Federal Aviation Administration's (FAA) air traffic control system. It is obvious to people knowledgeable in this field that Lord does not understand the subject.

In his Jan. 10 column, Lord stated that *Time* magazine explained a near collision of two jets over Lake Michigan as the fault of "programming errors." What in fact *Time* did write was, "The National Transportation Safety Board [NTSB] investigation may take several weeks, but preliminary findings point to some computer error, perhaps because it was fed wrong information."

This statement may sound like a computer problem to the layman, but those familiar with DP, as Lord purports to be, realize a computer is not in error when it is fed wrong information.

Further investigation by Lord on this particular incident would have revealed that the final findings of the NTSB were "that the probable cause of this near-collision was the failure of the radar controller to apply prescribed separation criteria when he first became aware of a potential traffic conflict, which necessitated an abrupt collision avoidance maneuver."

In the same article, Lord suggested the FAA should "stand the system down until sufficient testing could be done to prove beyond the shadow of a doubt that those who rode the nation's airways were safely being handled by the DP used to control the system." If the system were taken down, the only backup system to the automated system would be the manual system.

We are sure most controllers would agree the automated system is considerably safer than the manual system.

DP is not "used to control the (air traffic) system." Controllers control the air traffic system.

Three Concerns

Lord further stated the first of his three concerns in dealing with the problem was "the standards used to construct, test and 'certify' the FAA's air traffic control system."

There are thousands of pages of specifications that each system is tested against before it is certified for use by the air traffic control system. As much time is spent testing as developing a system, including final acceptance testing by each Air Traffic Facility, the ultimate user.

His second concern — "the potential for someone so inclined to cause such a mid-air collision on purpose" — was sensationalism in its purest form. Any individual inclined to sabotage the system would be incapable of doing so because of the many checks and balances incorporated, both internally and externally, in the system.

More important is the fact that the controller, not the computer, ultimately has control of the airspace.

As for the third concern, "the right of the flying public to know it is protected or to know the extent to which it is not protected," we agree the public has a right to know; that is the purpose of this commentary and we hope that, if there are doubts or questions, the public will inquire about them.

Again in this article, Lord wrote, "Clearly it's time to stop the system until it's proven to be safe. The controllers have indicated the problems shifting back and forth from the automated system to the old manual system. One wonders why the air traffic controllers' union hasn't struck over the issue."

Of course there would be problems shifting back and forth from automated to manual systems. This is one reason why the system is constantly being improved — to eliminate the need to shift to the old manual system.

As far as controllers are concerned, this system was designed for controllers with the aid of controllers, and it is being maintained and improved by both controller-computer types and pure-computer types.

In his Jan. 17 column, Lord said "computer system outages are largely transparent to the aircrews on duty above Flight Level 18, or 18,000 feet." This is true for any flight level, or altitude, and why shouldn't it be?

In addition, Lord wrote, "It appears that in their rush to computerize the skies, the [FAA] wizards overlooked a number of critical aspects of air control."

The automation of this system took over 10 years to reach its present level of sophistication and if anything was "overlooked," it was with reason, since the controllers themselves specified what aspects of air traffic control should be automated.

Lord further stated that "much data which could effectively be telemetered to automated traffic control radar stations is required by the FAA to be relayed via radio." This is so because, with such a large and complicated system, some items were to be added on features at a later time.

This approach was planned to allow for improved capabilities to the automated system, but the tendency is not to "rush" into increasing the "computerization of the skies" without a complete evaluation by the "wizards."

Lord stated later that "computer-generated enhancement of aircraft identification data presents yet another problem. The characters displayed on the screen are large enough and sufficiently luminated to negate or obliterate the radar-echoed 'skin' image, that image returned by the metal of the aircraft itself."

The controller has the capability through the computer system to vary the distance and/or direction of the identification data to any one of 32 locations surrounding the target.

Also, he can vary the intensity of the data presented or vary the intensity of the radar image independent of the identification data.

We do not think that Lord investigated this matter any more than he investigated any other matter he reported in these articles. This statement was based on some of the obvious misrepresentations presented in these articles.

The NTSB reported that 1976 was a banner year for aviation safety. The airlines, with 45 fatalities, most of them in the Virgin Islands accident, had the best safety record in more than 20 years, a record which is all the more remarkable when one considers that 1976 set a new record for the number of passengers carried by the U.S. airlines, about 220 million.

There is a continuing effort in the National Airspace System for refinement, development and improvement of the system to ensure safe air travel now and in the future.

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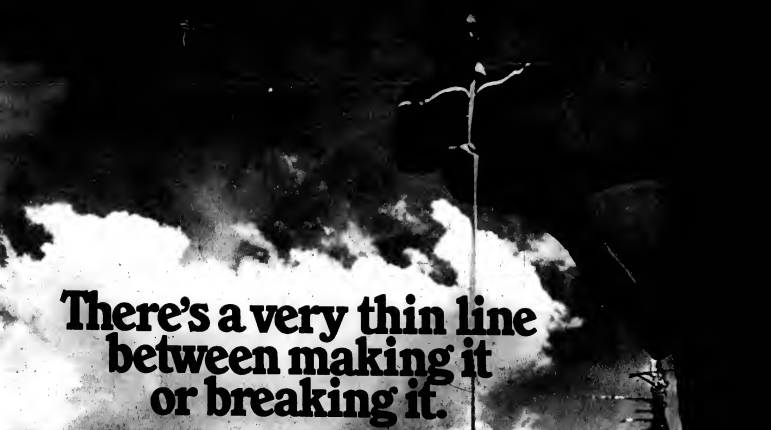

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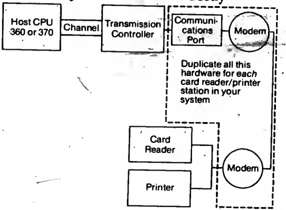

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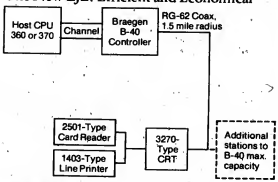

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Changing Jobs Seen as Remedy for Paranoid Fantasy

By Jonathan Sachs
Special to Computerworld

Miles Benson has my full sympathy. His paranoid fantasy is one I used to share ["Why Would a DPer Ever Give Up His Vacation Rights?" CW, Jan. 24.]

Like him, I have often worked hard for little reward and less praise. I once thought I was being exploited. I'd like to explain why I no longer think so — and what I think instead.

Once I worked as a programmer for a company I'll call the Flapmakers' Liability Underwriting Bureau (Flub). Like Benson's company, Flub often signed contracts that pressured us to get software out in too little time. But that's not all.

It showed symptoms of mismanagement that were downright absurd in a company whose business was providing computerized services. Despite a multimillion-dollar investment in DP equipment, it used no productivity aids more modern than a multiprogrammed operating system.

Its operators scheduled jobs by hand. Its production staff prepared end-users' monthly statistical reports on typewriters.

Why? Malevolence? Slave driving? I thought so. Then came the remodeling incident. It wasn't unique; similar things happen in lots of places. But it was very instructive.

Flub's top management decided to remodel the office. This was no minor deal; they were going to move permanent walls around and replace 100% of the furniture. We were grateful; if our working conditions didn't improve, at least our surroundings would.

Then we saw how the job was going to be done. "Office landscapers" were engaged. All planning was done behind closed doors. Department heads were consulted, but mostly in a rubber-stamp capacity. We programmers, who would have to live with the results, had no input at all.

We complained, to no avail. Once we cornered the planners and had a bull session, where we told them exactly what to do and why. They were fascinated; they had never designed for a programming staff before, and they really wanted to know our needs.

Our management found out and arranged the planners' comings and goings so that we never saw them again.

The result was predictable. Our medium-sized office rooms were combined into a few huge rooms which became so noisy that no one could concentrate.

We were given identical chest-high cubicles with everything bolted down except the chairs. Drawer space was excessive; shelf space was inadequate. For listings, there was no usable storage at all.

But wait: I've saved the worst for last. Most of Flub's programmers were originally on the same floor as the computer. In the course of remodeling, we were all moved to a different floor and replaced by the marketing staff.

Every time a programmer wanted to submit a job or see if one was run, he had to go down a flight of stairs.

Eroding Fantasy

As I watched these antics, my paranoid fantasy began to erode. I had assumed Flub was exploiting me to maximize its profits. But if so, what made it do things that destroyed my productivity?

It should have given me the best tools and environment it could afford — and then exploited me.

Some of us believed that our management, in its ignorance, thought decent furnishings were not cost-justified.

But that had to be a red herring for they spent gobs of remodeling money on some things that weren't cost-justified — renovating the restrooms, for example.

Some of us believed the problem was caused by an information vacuum; but our efforts to explain our needs were so persistently rebuffed that saying "information vacuum" was begging the question.

Anyway, it didn't take an expert to see that if you moved programmers away from the computer and marketing reps near it, overall productivity would suffer.

I had to conclude that the profit motive was not operative at Flub. Our problems were caused by indifference, not exploitation. I didn't understand why, though, until I found the answer in a book: *The New Industrial State*, by John Kenneth Galbraith.

Galbraith said a corporation does not have "motivations" any more than a computer does. A corporation is composed of people, and its "motivations" are those of the people who control it.

What were Flub's managers motivated to do? They tried to maximize their own profits, but even that was a less important goal than most people would assume.

Modern social values and tax laws discourage great accumulations of private wealth, so managers divert much of their energy toward pursuing other prizes.

One such prize is the status symbol: the corner office or the five-telephone desk.

Yet there is another kind of prize, not widely recognized, which may be more significant. I call it the "plaything."

Reader Commentary

A plaything is a good or service that a manager wants for selfish reasons, but can't afford. The corporation provides it free, on the excuse (often legitimate) that it is needed for business activity.

Any computer programmer should understand the concept of a plaything; the computer is his plaything.

Now I can explain why Flub remodeled its office so poorly. The office was a plaything; the remodeling plan was a game.

The top managers had a grand time holding conferences, deciding what should go where and signing contracts for new furniture. They were just playing dollhouse, and the needs of the "dolls" — as people or as workers — were irrelevant.

So that's why you feel so ill-used, Benson. There is no malevolent plot to squeeze you dry. You're just a doll in someone else's dollhouse.

I have a suggestion for you and for anyone else who suffers from the paranoid fantasy: change jobs.

Find a boss who understands that the corporation is a big playpen and is willing to allow his employees some of the same benefits he takes for himself.

Or find an old-fashioned pirate who's in business for the money and owns his own company, so that he can pocket the profits instead of drawing a salary.

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For Development, Production

Packages Seen Way of Life at Non-Profit DP Center

By Don Leavitt
Of the CW Staff

ALLENTOWN, Pa. — "One of the most significant problems I face is programmer productivity." A phrase, almost a cliche, voiced by many DP managers.

But one that takes on more urgency when the speaker is the director of a computer center that's set up as a nonprofit corporation to service a group of area hospitals.

Allentown Sacred Heart (ASH) computer center here is such an organization and Roger Winner, its director, has a 256K IBM 360/30, a 512K 360/50 and 35 some employees all directly involved with DP. Winner is convinced he couldn't get the work done without the dozen programmers he has now and "an awful lot of proprietary software."

Productivity is important, but not enough for Winner. He wants reliability, too.

"It isn't just a matter of producing something quick and dirty. It's got to be something that will stay up there and run. Our operation is running 24 hours a day, seven days a week, 365 days a year," he noted.

In support of the programmers, the center currently has Metacobol and the Librarian packages from Applied Data Research, Inc., the Scobol preprocessor from Software Consulting Services and the bidirectional cross-reference utility from Hansco Data Processing.

After a substantial search, ASH installed the Total data base management system from Cincom Systems, Inc. "and defaulted" into use of Total's companion product, Environ/1, as a communications monitor. Winner cited no particular problems with Environ/1 but said "there's nothing strong out there that attracts me as a communications monitor."

Not Only Area

Programming and systems development isn't the only part of ASH that has utilized outside software.

"There's no way we could handle the 22- to 23 hours of production we have each day with standard DOS/360," he said, noting the center has all of its source and object programs and JCL procedures cataloged on disk and all of its production programs handled by a relocatable loader — Relo from Universal Software — so they can be run in whatever partition is available as they come up in the jobstream.

At the end of the production process, ASH utilizes the Asap spooler from Universal Software to move printer output to disk for intermediate storage until the printer is ready to accept the work.

ASH is in a transition period, moving from a simple batch operation to on-line processing. The scope of the processing is changing fairly conventional accounting and billing runs to an information system that truly supports the hospitals.

As Winner explained: "At the heart of a hospital lie requests for specific services. At the heart of a hospital information system will be the processing of those service requests."

Winner sees his first task within the new environment as the automation of the communication of those requests among the various ancillary departments. The second task will be to schedule the requests through the computer.

Currently ASH has an on-line system attacking the "who's where" type of problem and a five-year plan for meeting the rest of the needs, "but I suspect it'll develop into something more like a 15-year plan by the

(Continued on Page 32)

Routines Put Batch Programs On-Line

WALTHAM, Mass. — Routines designed to provide on-line data entry and inquiry facilities for financial packages from San Diego-based Infonational are now available from The Management Group (TMG).

The routines generate CRT screen images and then validate data or accept queries keyed in by users in response to the screens, according to a TMG spokesman. Infonational systems supported by these facilities include the general ledger, accounts payable and fixed-asset accounting packages, he said.

Full on-line validation of such items as accounts and organizational numbers is possible, TMG explained, because the validation table files used by Infonational are organized for direct access. The TMG routines support updating of those validation tables as well as the application-specific data files, the vendor said.

The basic general ledger and accounts payable screens provide for batch balancing before any data is written to the transaction file. Imbalances are immediately brought to the operator's attention so input can be reviewed and corrected before it enters the system, the spokesman noted.

On-line inquiry is supported for the accounts payable cash requirements report and the general ledger trial balance and financial statements, TMG said. Creation of the reports themselves as well as all updating of the tables or files is done in batch mode since Infonational's packages utilize sequential master files, the company added.

Cost of the TMG routines varies with the number of screens and their complexity. A single set of on-line programs for general ledger can be obtained for $3,000 if no modifications are needed and the user installs the software without TMG help. If a user is not yet on-line, TMG noted it can provide software for a single-thread monitor teleprocessing function.

Acquisition of the Infonational packages can be arranged by the user by contacting that vendor through P.O. Box 82477, San Diego, Calif. 92318, TMG said from 393 Totten Pond Road, Waltham, Mass. 02154.

What's the Use?

Utilities — software routines that are not application-specific but are intended to perform DP functions common to many applications — were among the earliest of packages and are still among the most widely used.

Computerworld is planning a special April report reviewing the availability of utility packages and how — and how well — they are being used.

Readers are invited to contribute articles describing their experiences with utilities and with their vendors. Selection processes, expectations, problems and results from using the packages are all of interest.

Contributions should be typed (double-spaced, please), limited to 1,200 words (four or five pages) and sent by March 18 to Don Leavitt, c/o *Computerworld*, 797 Washington St., Newton, Mass. 02160.

'P-Edit' Backs Datasystem User With Multiterminal Data Editor

MONTREAL — Minicomputer Business Systems has introduced P-Edit, a program editor which it said allows data entry and maintenance of program source files under the TSD time-sharing monitor of Digital Equipment Corp.'s Datasystems under CTS 300.

The independent's software provides every terminal on the system with the concurrent capability of program entry and editing. Previous to this, only a single job monitor was available from DEC to support these functions.

P-Edit runs in 4K words of memory and provides 14 editing commands. These allow for the opening of files for limited purposes, including READ ONLY, WRITE ONLY or BACKUP for editing, the vendor noted.

Other commands permit the reading and writing of pages, which include 75 to 100 lines of source code, forward and backward line advance and the use of list and delete features.

The package's commands can also be used in connection with a string search facility and another that permits insertion of new lines into existing source code, the vendor said.

P-Edit will run on any DEC Datasystem under CTS 300 or the earlier COS 350 environment. A limiting factor may be the need to have in memory as many copies of P-Edit as terminals under its control, the vendor acknowledged.

The package is available for $100 plus a media charge. Full documentation and binaries are included, a spokesman said from 892 Sherbrooke St. W., Montreal P.Q., Canada H3A 1G3.

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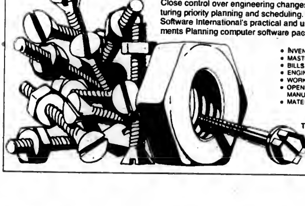

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'Floating Buffers' Enhance Performance of 'CA-Sort'

NEW YORK — A "floating buffer" technique included in CA-Sort Release 77 Version 4.0, now available from Computer Associates, Inc., is said to provide "astonishing new sort performance" within almost any of the IBM 360/370 environments.

Until now, systems used fixed buffers to handle the exchange of data blocks between the work devices and the sort process, Computer Associates explained.

Flobuff — the company's name for the new technique — uses an internal buffer assignment dynamically driven by the actual needs of the sorting process, a spokesman added.

Performance 'Substantially' Improved

Performance of the sort for both OS and DOS has been improved "substantially," he continued. The sort runs faster with optimized I/O functions on both OS/SVS and MVS while selective page-fixing assures better use of virtual storage, he claimed.

While automatic secondary workspace allocation and release have been features of CA-Sort in previous versions, working storage requirements have now been further reduced and native support for IBM 3350 devices is now standard,he said.

The sort is totally reentrant and allows optimum use of main storage particularly on VS systems since full Virtual I/O support has been made available.

The update also provides for record selection through INCLUDE/OMIT statements and better control of record sequence through an EQUALS option.

The package costs $5,500 for DOS and DOS/VS and $7,700 for OS and OS/VS. Other payment arrangements are also available, the company noted from 655 Madison Ave., New York, N.Y. 10021.

Mailing Labels Handled in RPG

ORANGE, Calif. — A mailing label package, now available from Panatec, Inc., is written in RPG-II for use on the IBM 3 or many other small business systems, the vendor said.

The developers avoided capabilities of RPG-II peculiar to the IBM 3, however, and the programs will run on larger systems such as IBM 360/370s that support the language, a spokesman added.

The software is said to provide a range of facilities including Zip Code master and label master file maintenance, label groupings in accordance with post office specifications, selective label output and a variety of optional output formats.

As written, the programs are prepared for disk-based files, the spokesman said.

Output formats, generally speaking, include the choice of how many labels are printed across a page. Print images may also be put out on magnetic tape,he said.

A $3,500 license fee covers source code for all programs and documentation. Updates and revisions are provided free for one year, Panatec noted.

The company is at 1527 Orangewood Ave., Orange, Calif. 92668.

'Total' Users Aided By 'Tums' Upgrade

ATLANTA — The Tums utility maintenance package developed by National Computing Industries, Inc. (NCI) for use with IBM-oriented versions of Cincom Systems' Total data base system has been enhanced.

Tums Version 4 now generates its own control cards directly from the data base definition (DBMOD), NCI said.

Other extensions include the ability to selectively dump records from any data set and support for user exits in the dump and load functions.

Users of Tums 4 can also selectively repair broken linkages, selectively delete records within a chain and obtain complete synonym and chain statistics, a spokesman added.

The update supports complete device independence and a high-speed loader, he continued. Purchase price is $3,450 "with terms available," the company noted from 6075 Roswell Road, Atlanta, Ga. 30328.

Non-Profit Center Depends on Packages

(Continued from Page 31)

time we're finished," he said.

Winner dislikes the phrase "structured programming," but strongly backed the constructs of the methodology and the discipline they imply as "a very significant way to go" in program development. On the other hand, he feels Cobol is an inappropriate language in which to try to implement the constructs directly.

Despite the weakness of Cobol as a language, Winner wanted portability of his programs. So even the preprocessor he sought as a means of extending Cobol, according to Winner's rules, had to be written in ANS Cobol.

That need is real, he said, noting "we feel strongly we'll be running our on-line work on a group of minis, or something else, within five years."

Scobol Pilot Site

Even though Winner had high marks for Metacobol, it isn't written in ANS Cobol and is limited to IBM gear, so he sought out an alternative and acquired Scobol to provide the structured extensions he wanted.

ASH was the pilot site for Scobol in the U.S. and there was a fair bit of work required to adapt it to Winner's environment. It was card-oriented, for example, and ASH was not, so that had to be changed.

The package also produced an ANS course deck which had to be input to a compiler and ASH disliked that. Winner decided he wanted program maintenance at the Scobol level, so the intermediate results feeding into the compiler were made transparent to his staff.

Integration Needed

And the bidirectional cross-referencing capability which the staff had found extremely helpful in normal Cobol runs had to be integrated into the listings produced by Scobol.

ASH got the package in May or June of 1976 and the adaptation work took the better part of three months. But since last autumn the center has had the latest of its collection of proprietary software tools in place and operational.

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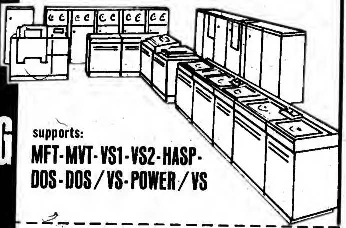

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Consultant's Warning:

Benchmarking Used Incorrectly for DBMS Evaluation

By Stephen L. Robinson
Special to Computerworld

Benchmarking, a time-tested technique for selecting software, is being widely used to select data base packages. In most such cases, however, benchmarking is being used incorrectly.

Consider the history of benchmarking. On first- and second-generation computers, software benchmarking was a straightforward process. A test data set was created and run, employing the packages under consideration. A stopwatch was sufficient to assess performance.

When multiprogramming and multiprocessing came to the fore, however, a stopwatch was no longer an adequate measure of performance. CPU time, channel time and memory requirements had to be measured and a weighted score, derived from those components, used as a decision-making criterion.

While benchmarking in a third-generation environment is clearly more difficult than in previous generations, it is still a relatively well-defined process.

The same cannot be said for benchmarking a data base package, especially if the package is to be employed to develop a data base system.

Although Rabinson appases benchmarking as a valid means of selecting data base systems, he believes there are other ways of canducting evoluatians and he will caver them in o later article.

To understand the complexities of benchmarking a data base package, let us consider some of the invalid approaches presently being employed.

Application Benchmarking

In its simplest form, an orgnization selects a "very important application" to run as a benchmark. It should first be noted that a single application, no matter how important, rarely constitutes a significant percentage of the total DP activity in an organization.

That aside, let us consider the benchmarking mechanism itself: All too frequently, data base package vendors are asked to supply a file design for the application. Often, the vendors assist in the logic of the code for the application.

Resultant benchmarks therefore indicate how well the vendors can tune their own systems. No indication is given of how well the organization itself will be able to work with the package.

How many times have you seen a product demonstrated on television and discovered after purchasing it, you simply cannot cope with the products' complexities? The demonstrators, needless to say, spent considerable time perfecting their use of the product, but they may have extremely large hands, "double-jointed" fingers or some other physical anomaly which facilitated their performance.

Without the same capability, you are at a tremendous disadvantage.

A more serious drawback to application benchmarking derives from the expected use of the data base package. If the intent is to develop a data base system with multiple applications feeding from the same set of files, the performance of one stand-alone applicaion may not be indicative of the overall performance after all the structure data to support other applications has been incorporated into the system.

For example, one organization selected its data base package based on superior performance in the production of a sequential report of its inventory. However, when the inventory files were linked to customer files and to order files, the sequential report slowed to a virtual halt.

By contrast, a later benchmark of a package with poorer stand-alone performance revealed little performance degradation from stand-alone to integrated system, exhibiting superior performance for the all-important inventory report.

Because of its simple nature, many organizations run load benchmarks. Several points must be made here:

- With most data base packages, space reutilization has been refined so file reorganizations are not all that frequent and do not always require complete unload/reload operations.
- Loading a file without the complexities of the structure data required for access via multiple keys is not representative of load times with the structure data.
- There are many tricks to loading files. A vendor run load may not be indicative of load times you will be able to realize.

Data Basics

DOs and DON'Ts

- DO the benchmark yourself. It will cost you more, but . . .
- DON'T let the vendor do the benchmark.
- DO let the vendor help you do the benchmark. Try to assess from user experiences how much help you can expect from the vendor after you have acquired the package and then limit the vendor's help accordingly.
- DON'T use loads as benchmark jobstreams unless you do a lot of data entry and little data accessing or you have large files (several hundred thousand records or more) which require frequent backups and restores.
- Do third-generation, not second-generation benchmarks. Account for CPU time, channel time and core requirements.

Rabinson is manoger af datobase technology ot CACI, Inc.-Cammercial in New York City.

Clarification

Ramis II — introduced recently by the Mathematica Products Group, Inc. [CW, Jan. 31] — is available as a package for in-house use or as a service on the Informatics Data Services network, headquartered in Fairfield, N.J.

The original Ramis can be acquired as a package or as a service on the National CSS, Inc. network, based in Norwalk, Conn.

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Attn: Gloria Alvarado

The company currently owns two medium size IBM 370/115 systems and is in the process of expanding them.

A minimum of one person assigned for a period of one-two years will be required.

Free Audit Routines Extend 'Easytrieve'

OAK BROOK, Ill.— Thirty-two basic routines that make up, in effect, an entire auditing extension of the Easytrieve retrieval system are available free from the vendor, Pansophic Systems, Inc.

The routines were published by Pansophic in an 82-page booklet called *Easy Audit 77*. While a number of the routines were also listed in *Easy Audit*, last year's publication, 60% of them are new, a spokesman noted.

Another 10% have had capabilities added since they were printed last year, he said.

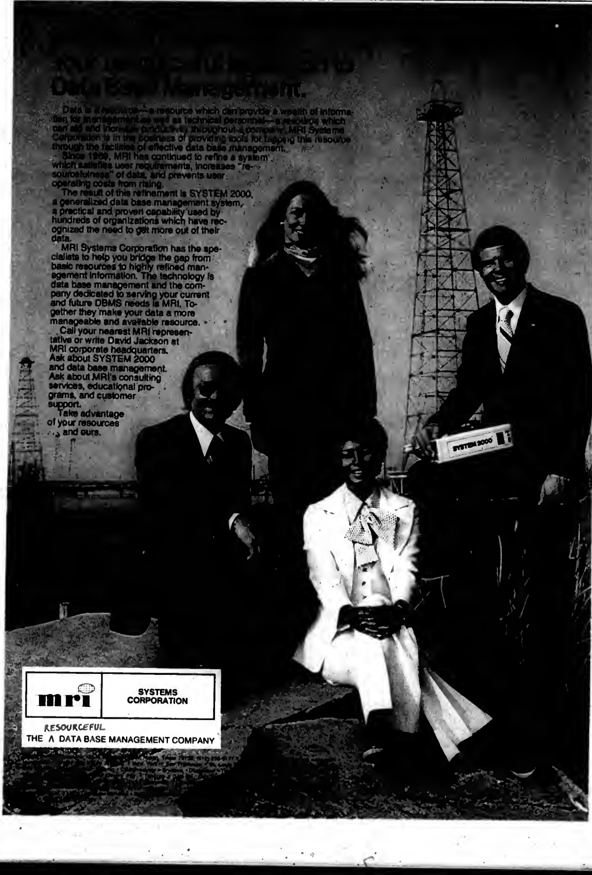
This year's booklet is divided into logical groups so that auditors or other users can find what they need quickly, Pansophie said. Classifications include "information reporting," eight routines covering the retrieval and meaningful display of data, and "exception reporting," with six routines pertinent to verification of computer file accuracy.

Other groupings cover statistical analysis and sampling as well as "computer job accounting," with three routines designed for monitoring computer activity.

Packages Described

The booklet describes the Easytrieve system, required as the base software for each of the published routines, and Panvalet, the program management and data security system Pansophic advocates as another tool for auditors in dealing with DP management.

Easy Audit 77 can be requested from the Communications Manager, Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, Ill. 60521.



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Data is a resource—a resource which can provide a wealth of information for management as well as technical personnel—a resource which can aid and increase productivity throughout a company. MRI Systems Corporation is in the business of providing tools for tapping this resource through the facilities of effective data base management.

Since 1969, MRI has continued to refine a system which satisfies user requirements, increases "resourcefulness" of data, and prevents user operating costs from rising.

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DOS/VS Library Usage Extended

FORT LEE, N.J. — The Shared Library Support (SLS) system from Oxford Software Corp. allows multiple CPUs operating under DOS/VS to share the same system residence libraries and any private libraries, according to the vendor.

SLS consists of replacements for IBM's Linkage Editor and MAINT routines, Oxford said.

That combination allows "any maintenance of any library at any time from any partition," a spokesman claimed. As an example of SLS's ability, he said any partition can condense any library, including the system core image library, at any time with active foreground partitions.

All directory and library space in all libraries is reused, however, and this extends the time between library condenses, the vendor said.

Optional Protection System

An optional protection system allows any member of any library, whether phase, module, book or procedure, to be protected against accidental or unauthorized deletion or modification.

A source statement library maintenance facility includes a "complete" SCAN capability extending to support for scanning of entire families of books, Oxford said.

Among other features, he also cited the availability of the relocatable library catalog direct from SYSLNK and support for full generic names of all delete, protect and unprotect functions.

SLS is available under permanent license for $5,000, a yearly lease costing $2,160 or monthly payments of $200 per site.

The package can be used in conjunction with the Our/Power multiple CPU spooling system introduced last month [CW, Jan. 10], Oxford said from 158 Linwood Plaza, Fort Lee, N.J. 07024.

Airline Spare Parts Tracked by 'Alics'

RENTON, Wash. — The Air Line Inventory Control System (Alics), used to monitor availability of spare parts, is now available from Boeing Aerosystems International, which claimed the system conforms fully with the standard U.S. Air Transport Association Specification 200.

Written in Cobol, Alics uses about 100K memory on IBM 360/370 equipment, the vendor said from its offices in Renton, Wash. 98124.

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CDMS Workshop 1:00-3:00 p.m.

Workshop session for attendees to explore how they could use CDMS with specific applications of interest to them or related technical questions in meaningful depth. These sessions will be conducted by key members of the Cullinane Corporation CDMS support staff.

EDP-AUDITOR/CULPRIT 1:00-3:00 p.m.

A separate presentation for technical and management personnel on the Cullinane Corporation family of Report Generating Systems including CULPRIT, EDP-AUDITOR, EEO-REPORTER. Particular emphasis will be placed on feature-benefit analyses, competitive factors and user experiences.

Social 3:00-4:00 p.m.

Opportunity to meet with members of the Cullinane Corporation Technical and Management Staffs in a relaxed and casual environment.

Seminar Leaders

William E. Linn – Dr. Linn is Southeast Area Manager for Cullinane Corporation, responsible for all marketing, training, and technical support activities in that region. He has had extensive practical experience with database systems. As a senior member of Southern Railway's Programming Systems Staff, he directly supported both IMS and IDMS in a database administrative capacity. In addition he played a key role in the conversion to IDMS for that firm. Dr. Linn holds a Ph.D. in computer science from the University of Michigan. He currently lectures on database design for the Cullinane Customer Education Division, and teaches classes in data structures and list processing techniques at the Georgia Institute of Technology.

Adrian W. Hollander – Mr. Hollander is Vice President in charge of Cullinane's EDP-AUDITOR System and its Library of Audit Routines, including many widely used computerized auditing techniques. Prior to joining Cullinane, he headed the audit department of Beverly Bancorporation, Inc., where he gained valuable experience in audit, reporting, and accounting systems. He was formerly a Senior Accountant on the staff of Arthur Anderson & Company. Mr. Hollander is a CPA and holds a B.S. degree in Industrial Administration from Iowa State University.

Raymond J. Nawara – As Southwest/Plains Area Manager, Mr. Nawara is responsible for all Cullinane marketing, training, and support activities in those regions. Prior to joining the firm, he was Database Administrator for the Health and Hospitals Governing Commission of Cook County, Illinois, where he was involved in the design and implementation of various health and patient-care database systems. In addition, he was Database Manager of Motorola, Inc., where he developed a bill-of-materials database system, as well as a complete RJE network, and several manufacturing applications. He is a graduate of the University of Houston with a major in mathematics and a minor in computer science.

Where To Go

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GRI 99 Gets Sort

NORTH BRUNSWICK, N.J. — A utility package that supports sorting and merging on the GRI Computer Corp. 99 small business system, Filesort adapts to available memory, according to GRI.

The $1,667 software can be used to sort from and to CRT terminals, cards, paper tape, magnetic tape or disk.

An interactive text editor for preparing sort specifications is included, the firm said from 870 Georges Road, North Brunswick, N.J. 08902.

Payroll/Personnel System Enhanced

BERKELEY, Calif. — The Payroll/Personnel system from Argonaut Information Systems, Inc. has been enhanced to provide even more accountability reports than in the previous version, according to the vendor.

The update also provides employer as well as employee tax calculation routines,a full-payroll general ledger and labor distribution facilities and support for direct deposit of employees' payments into their bank accounts through automated clearinghouses, a spokeswoman noted.

The programs have been redesigned to help with reporting requirements of the Federal government, including the Equal Employment Opportunity EEO-1 report, and with the user's internal bookkeeping, including a check reconciliation feature.

The payroll portion has been revamped for increased flexibility in deduction handling, including tax-free annuity deductions, the spokeswoman added.

The system allows for 20 nontax repetitive deductions in fixed or variable amounts and three one-time deductions per pay period, she said.

Federal and State Taxes

Thirteen pay categories are supported and both federal and state taxes are calculated with as many as three interstate transfers per quarter (or five per year) allowed, she continued.

Modular in design, the system is written in ANS Cobol for use on IBM 360/370 CPUs or "almost any other equipment" that supports Cobol. In an IBM environment, it requires 64K bytes of memory, the company noted.

The software package costs $5,500 and is available now from Argonaut at 2140 Shattuck Ave., Suite 205, Berkeley, Calif. 94704.

Audiovisual Courses Feature IMS/VS

SCHILLER PARK, Ill. — IMS/VS Enhancements, a set of multimedia courses now available from Deltak, Inc., covers those facilities of IBM's Information Management System (IMS) that are unique to IMS/VS and are not available in IMS/360, the vendor said.

An addition to Deltak's earlier IMS courses, the enhancements cover Program Isolation, Remote Work Station Support, the Virtual Control Region option and Vsam with IMS/VS, a spokesman explained.

The updates also cover Variable Length Segments, the Segment Edit/Compression Exit, Checkpoint/Restart Facilities and Secondary Indexing, he added.

The highlight of the series of teaching modules is said to be a three-course exposition of secondary indexing, ranging from concepts and programming through design implications and finishing with implementation skills training.

The IMS/VS Enhancement subseries consists of five multimedia courses and includes between eight and 12 hours of self-study instruction supported by videotape presentations and workbook exercises.

They are available for purchase, but more typically are included in a rental arrangement under which users acquire those courses they need for limited periods of time and then return them for replacement by others.

Deltak is at 9950 West Lawrence Ave., Schiller Park, Ill. 60176.

Schools Offered S/32 Package

ATLANTA — Small school districts and large secondary schools are the institutions most likely to use the IBM System 32 Student Administration System recently announced by IBM for its small business computer, according to the vendor.

The software system consists of three interrelated programs. The Student Records program, scheduled for delivery in August, is a prerequisite for both the Student Accounting and Student Scheduling programs, a spokesman explained.

The records program generates student profiles and schedules, class rosters and master schedules of classes. Course curriculum lists, instructor lists, instructor and room schedules and student name and address labels are also prepared by this program, IBM said.

The Student Accounting portion of the package manages attendance data and mark reporting.

Daily absence reports, including phone numbers culled from master records and listings of absences still unresolved from prior days are prepared by this program group as are report cards and various analyses of the data from which they are developed, IBM said.

The Student Scheduling portion of the package is said to provide a technique for matching students with facilities and time. This should result in faster resolution of registration and scheduling problems, the spokesman added.

The Student Records modules will be available for an initial charge of $945 and a monthly license fee of $45. Student Accounting, due in September, costs $1,050 plus $50/mo. while Student Scheduling, planned for December delivery, costs $1,260 plus $60/mo.

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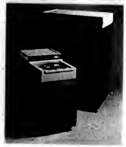

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Service Aids Engineering, Management of Project

WAYNE, N.J. — A computerized project management system may save the Cape May Municipal Utilities Authority (MUA) unnecessary costs and reduce the possibility of deficits during the six-year planning, design and construction of four regional sewer systems in a countywide environmental project.

Under contract to the MUA, Pandullo Quirk Associates (PQA), an engineering consulting firm, uses such a system to monitor activities and cash flow for each of the regional systems in the project.

Telor II schedules and controls financial and resource requirements of a project on a time-sharing basis. It was developed by Norbert Beyrard France Co. in Paris and is available on the National CSS, Inc. remote-computing network.

Quick Response

The system is used to respond to delays or changes in the complex project and to reschedule all affected activities along their critical path. Simultaneously, it allocates cash resources and expenses to reflect the new schedule and predicts where and when deficits might occur as a result of the delay.

Because the Cape May project is federally funded, grants are made for completed work rather than for work in progress. This can present a serious cash management problem for both the engineering consulting firm and its client.

"The size and complexity of this project requires an automated system," according to Dr. Karel Konrad, manager of PQA's Systems and Data Analysis Group.

"The federal funding in construction of the four systems amounts to approximately $235 million. When such large sums are involved, even a small scheduling change creates significant financial problems," Konrad noted.

Elements of Chance

The probability of scheduling changes is high in a long-range project like Cape May's for a number of reasons, not least of which is the physical area affected by the authority's program: a 265 square-mile area which includes many of New Jersey's major beach resorts.

Special problems include the geography and political subdivisions within the county and the growth of its summer population, to nearly seven times its permanent population of 75,000.

An additional element of chance in scheduling environmental projects is the federal requirement for local public involvement and U.S. Environmental Protection Agency approval at designated stages during the study. Thus, certain activities may be delayed in all or any of the four county regions during an unexpectedly long approval process.

"Unexpected delays could find the MUA short on cash," Konrad said. "Telor helps to predict and thereby forestall such situations.

"We can reallocate funds to parallel activities unaffected by a delay or, if a deficit situation is predicted, find alternative funding soon enough to prevent it," he explained.

In the beginning, consideration of alternative plans required computerization of over 4,000 different alternatives including number, size and location of treatment plants and disposal possibilities before the present plan for four treatment plants and three ocean outfalls was recommended.

The first step of planning the Cape May project began in December 1975 and Telor was brought into the picture in June 1976. Initially, all activities involved in the entire project were entered into the system.

In the first step alone, PQA had to schedule and allocate resources to accomplish such tasks as assessing alternative plans, conducting natural resource inventories, making cost analyses, projecting population and conducting oceanographic field surveys.

The two and a half year planning stage overlaps the beginning of the design stage, which entails the design of all four regional systems, the structure and treatment process of the plants and the ocean outfalls which discharge the effluent.

Overlapping the three and a half year design stage, the construction phase, which PQA will subcontract and then supervise, is scheduled for July 1977 through September 1982.

Service Now Has General Ledger

SANTA CLARA, Calif. — Packages from Software International Corp. (SI) for general ledger, accounts payable and accounts receivable processing are now available on a service basis through the facilities of the Optimum Systems, Inc. computer utility service.

Training, Support

Training and support for SI systems are provided by financial specialists and systems engineers through the utility's branch offices in San Francisco, Palo Alto, Los Angeles and Irvine in California and in Dallas, Salt Lake city, Washingon, D.C., and Chicago.

Optimum Systems, Inc. is at 2801 Northwestern Parkway, Santa Clara, Calif. 95051.

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70 Installations Report

Training Budgets Survive, But With Little Substance

By Don Leavitt
Of the CW Staff

BETHESDA, Md. — Budgets for training fare as well as those for other organizational functions when DP budgets have to be cut, according to a recent study of some 70 large-scale installations.

On the other hand, dollars set aside for training amount to only 1.2% of an installation's average total budget, the survey by Brandon Systems Institute, Inc. (BSI) found.

More than two-thirds of those responding reported training is generally cut in proportion to the rest of the budget.

Not only are training budgets uncut; they are growing. BSI was told by 85% of the users that their allocations for personnel upgrading were greater in 1976 than in prior years.

Programmers now receive more training (in dollar terms) than DP managers, according to the survey results. Recent emphasis on programmer productivity and structured programming techniques has "undoubtedly" increased training in this area, the researchers said.

The Human Connection

By calculating average budgets for training five categories of people within the DP installation and the average number of people in each category, BSI found $606/year is spent for each programmer and $511/year for each manager.

Systems personnel, at $439/year, fared less well and operations "continues in its traditional role" at the bottom on the pile, with an average $207/year spent on each person in that area, BSI said.

Operations came out with figures slightly higher than programming when BSI asked about expected cost per student day in a number of environments. For on-site training by an outside vendor, for example, the expected average cost for programmers was $78.60, while operators ran to $79.50.

For public outside vendor courses, respondents expected to pay $127/day to support programmer students, but $128/day for operations trainees.

From another question, BSI found installations depend heavily on internally developed and presented training for all groups. Audiovisual materials and courses were significant only to programmers and operations personnel, the study said.

When the users were asked about the cost effectiveness of the various options, 44% cited audiovisual as highest in their opinions.

On the other hand, BSI noted the responding organizations spent only 20% of their training dollars on such materials.

Considering sources of training, 43% of the users said their hardware equipment manufacturer was the single most important supplier. Small organizations spend as much as 90% of their budgets with the hardware vendor, the study showed.

When it came to a "make or buy" decision, many respondents — over 36% — saw availability of good-quality outside vendor courses as a primary consideration. The cost of developing inhouse training or going outside was a major concern for only 15% of BSI's study group.

IBM First Choice

IBM was the respondents' most often selected first-choice vendor in four out of five training categories: beginning programming, basic systems analysis, basic systems design and data base design. Yourdon, Inc. was the runaway leader in the area of structured design and programming.

The audiovisual vendors generally came in second except in those subject areas where a training vendor was particularly known. Performance Development Corp. was high in the data base area and Brandon, as well as Yourdon, was recognized by the users in the structured design and programming area.

When BSI asked about cost and quality of training, no vendor was rated better than average to good in the cost category. No vendor was rated less than average in quality and four — Brandon, Keane, Ware and Yourdon — were rated in the good to exceptional range.

IBM, though the top-heavy choice as a source of training, was rated as no more than average to good in both cost and quality.

Copies of the survey questions and results and BSI's interpretation of the results are available as a free 14-page booklet from BSI at 4720 Montgomery Lane, Bethesda, Md. 20014.

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LARGE COMPUTER GROUP

Flexibility Proves 'Hallmark' of Multivendor Network

By John P. Hebert
Of the CW Staff

KANSAS CITY, Mo. — When Hallmark Cards, Inc. started using data communications for various operations in the late 1950s, it "started with Bell equipment, as most do."

But the "social expression products" manufacturer headquartered here turned to independent vendors to obtain more flexible communications equipment, according to Ron Schmidt, teleprocessing analyst for the company's DP Technical Services Group.

Hallmark is saving about $2,100/mo in line charges by using International Communications Corp. (ICC) modems — and Bell modems based on the independent's design — in split-streaming network data, Schmidt said.

Known for its line of greeting cards, Hallmark also creates and manufactures gift wrap, stationery, candles, calendars and books, among other products.

To keep all company personnel working and informed, Hallmark's network carries data between two IBM mainframes at the central site here and 253 local and remote CRTs and 10 remote job entry (RJE) systems, Schmidt said.

Most of the CRTs and four RJEs are located at the central site and are linked to a 370/158 or 370/168 by hard-wired lines operating at 9,600 bit/sec and 19.2 kbit/sec speeds.

The remaining terminals and RJEs work out of warehouses here and at other company locations in Liberty, Mo., in the Kansas towns of Lawrence, Leavenworth and Topeka and in Enfield, Conn.

IBM CRTs, Mixed RJEs

All 253 CRTs are IBM 3270 and 3280 devices used for on-line inquiry and update, while the RJEs — used in applications development and graphic arts job tracking — include five Singer/Harris M&M 500 series stations, two IBM 370/135 workstations with two partitions, two minicomputers (Interdata, Inc. and Data General Corp.) and one IBM 2780, Schmidt said.

The 2780 communicates through hard-wired connections 660 feet longer than IBM recommends, he noted.

All of the data in Hallmark's "mammoth production and scheduling control system" resides on six IBM 3350 disks to track all manufacturing processes, shipments and shipment confirmations.

One IBM 2914 switch, two Memorex 1270 communications front ends and a Cooke Engineering modem interface switch link the central processing system with all parts of the network except the 173 local 3270 devices, which are tied to the 370/158 running under CICS through the 2914 unit, he said.

Combination of Lines

The remote devices communicate through a combination of AT&T lines carrying data at 4,800-, 7,200- and 9,600 bit/sec.

One of the two 4,800 bit/sec lines is a voice-grade circuit that is "really a private line" which Hallmark leaves up to save on private-line costs "which, locally, would be prohibitively expensive," Schmidt said.

The other, a multipoint line, carries data between ICC 4600/48 modems to six warehouses in Kansas City, each configured with two IBM 3275 stand-alone CRTs with controllers, he said.

The single 7,200 bit/sec line runs to Enfield, Conn. through a Codex 7200C modem for RJE order processing.

All four 9,600 bit/sec lines — Bell 3002s with C-2 conditioning — carry biplexed data for the independent CICS and JES2 applications through three sets of ICC Modem 96 Multimode units and one set of Bell 209A modems.

These modems are used to split the 9,600 bit/sec stream into 4,800 bit/sec channels, according to Schmidt.

Two of the four connections to local RJEs

(Continued on Page 42)

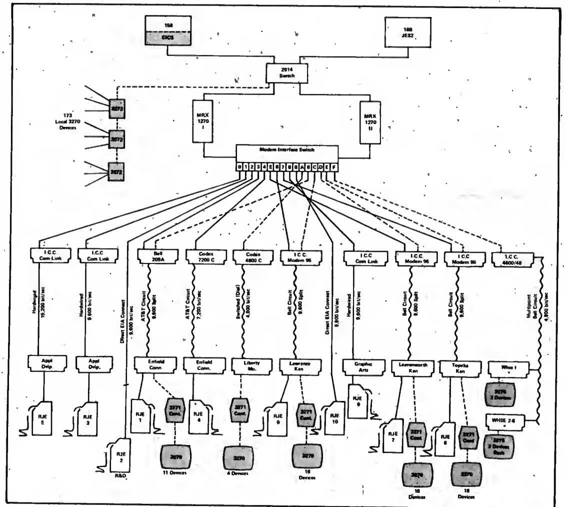
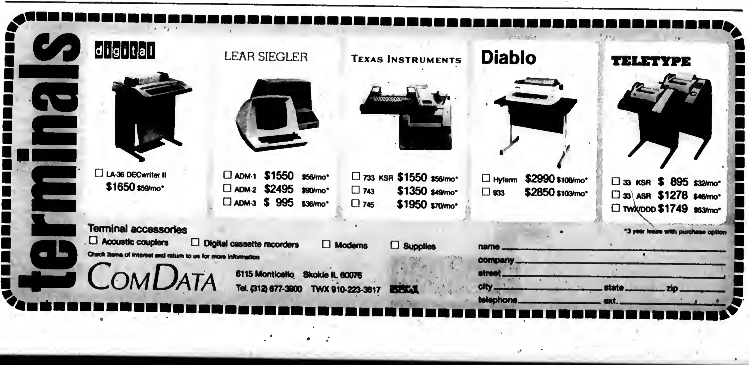


Chart Courtesy of Hallmark Cards, Inc.

Schematic diagrams Hallmark's network between company headquarters in Kansas City, Mo., and local and remote sites.



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CRTs Have Multifunction Capabilities

Data 100 Model 82 Features IBM 3271 Emulation

MINNEAPOLIS — Data 100 Corp. has unveiled a remote terminal system with IBM 3271 emulation capabilities.

The 3271-compatible Model 82 remote CRT system can also be configured with other Data 100 terminal systems to provide users with concurrent data entry, remote batch and on-line inquiry functions, a spokesman claimed.

Terminal Transactions

In addition to these capabilities, the Model 82's CRTs are multifunction devices, allowing users to operate each as if it were two separate units performing different applications, he said.

The system was designed for connection to an IBM host CPU via RS-232 modems and dedicated or dial-up lines operating at speeds from 2,000- to 9,600 bit/sec in half- or full-duplex modes.

In its basic configuration, the Model 82 system includes four multifunction Model 8784 CRTs and a remote CRT control unit.

Each 8784 CRT operates interactively with CPU-based programs and files on a real-time basis. Users can augment, modify or delete data displayed at each station and retransmit it to the CPU for storage or additional processing under the control of CPU-resident application programs, the spokesman claimed.

Shared-Applications Capability

Standard on-line file inquiry capabilities are enhanced in the remote terminal system by the shared-applications capability of each 8784 CRT, according to the spokesman.

Each station consists of a CRT and/or movable keyboard. The CRT screen can display 1,920 upper/lower case characters or 480 characters in a large character format.

An operator-controlled rollover switch located on the keyboard allows the dual-application operation, he said.

The remote CRT control unit serves as the interface between the communications line, CRT stations and, in optional configurations, line printers and other control units.

It has a processor, memory, operator control panel and a diskette storage device used to load control programs and for system diagnostics. Each control unit can handle eight 480-character CRT stations or four 1,920-character displays and comes with a keylock, according to the spokesman.

Four Line Printers

Four line printers available for the Model 82 range in speeds from 62- to 300 line/min and include 12-channel vertical format, 6- or 8 line/in. density and 132-column capabilities, the company said.

A maximum of eight printers can be connected to the system controller through a local line printer adapter and used as local or station printers located up to 2,000 ft from the system, Data 100 added.

The Model 82's CRT control unit can be added to the company's existing Model 74 Keybatch systems or the Model 78 minicomputer-based remote-processing CRT systems to give them IBM 3271 emulation capabilities, the spokesman claimed.

Multivendor Emulation

When the Model 82 system is configured with the model 74 or 78, each system is capable of emulating the communications of other vendors' equipment, including IBM 2780, 3780 and Hasp, Univac and Control Data Corp., the spokesman claimed.

These dual configurations allow the concurrent entry, remote batch and on-line inquiry/update functions, he added.

A basic Model 82 system, including the remote CRT control unit and four Model 8784 multifunction CRTs, costs $24,108 to buy, $718/mo including maintenance on a one-year lease or $589/mo for five years including maintenance, he said.

Printer Costs

The Model 82 with the optional line printer adapter and 62 line/min belt printer and controller costs $31,374.

The cost to upgrade a Model 74 or Model 78 system to include the IBM 3271 emulation is $4,704; the cost of upgrading the systems to include full Model 82 capabilities is $40,572, $1,198/mo for one year or $982/mo for five years including maintenance.

Data 100 is located at 6110 Blue Circle Drive, Minneapolis, Minn. 55435.

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Has Communications Option

IBM Adds Stand-Alone System 6 for Big Volumes

FRANKLIN LAKES, N.J.— IBM's Office Products Division has introduced a stand-alone information-processing system for large-volume users that can communicate with the firm's computer systems.

The IBM Office System 6, available in three configurations, is said to utilize advanced technologies to offer greater productivity for text editing, administrative record processing and data communications. The communications capability is optional on all system models.

The 6/450 has a CRT, 96-character keyboard, 274K-character storage on diskette, a magnetic card reader/recorder, a 92 char./sec ink-jet printer with multiple fonts and a paper feeder and stacker.

The 6/440 has all of the components of the 6/450 except the magnetic card reader/recorder; the 6/430 has that card reader capability, but does not include a printer, an IBM spokesman noted.

With the communications option, users can merge information from data bases with text and records on diskettes for applications such as mass mailings, he said.

2,400 Bit/Sec Operation

The systems can communicate over dial-up phone lines at speeds up to 2,400 bit/sec depending on the modem selected, from system to system or to any of IBM's mainframes or minis, he stated.

The CPUs must be programmed to accept communications from the System 6 models, he noted.

The communications feature can be added to the information processors for $122/mo under a one-year rental plan or $107/mo under a two-year lease. Cost of the communications capability is $4,270, according to the spokesman.

The IBM 6/430 costs $470/mo, on the one-year plan, $415/mo under the optional two-year plan or $16,450 to buy. The 6/440 costs $800/mo rented, $705/mo leased or $28,000 to purchase; and the 6/450 costs $910/mo for one year, and $800/mo for two years or $31,850 to buy.

IBM's Office Products Division is located at Parson's Pond Drive in Franklin Lakes, N.J. 07417.

IBM 6/450 operator station

Flexibility Proves 'Hallmark'

(Continued from Page 40)

at the host processing site are made through ICC Com-Link II modems for applications development for the firm's DP group, Schmidt said, adding the modems operate at 19.2 kbit/sec.

The volume of data coursing through Hallmark's networks is tremendous, Schmidt said, adding that even with the split-streaming technique "we're getting to the point where the lines can't carry all of the data and we will be forced to modify them in the future."

For now, however, the split-streaming technique "nets out" the difference in cost between the higher priced modems by using fewer of them and saves $2,100/mo in line costs.

The lines are up 132 hours each week carrying mainly data, but also voice communications. Each has dial backup in case of line failure, Schmidt said.

"The ICC Multimodes have the great capability of running at high speed on dial-up lines for the backup situations" and frequently run as well at 9,600 bit/sec on dial-up as on the conditioned lines, he added.

"They are the most flexible modems I've ever seen. Bell designed the 209A after it," he pointed out.

Schmidt looked at Bell 209A and Codex 9600C modems before choosing the ICC Multimodes, but they did not have the flexibility of dial-up line reliability, he said.

Hallmark utilizes Memorex 1270 front ends rather than IBM devices because the company had the system before 3705s existed, he explained. When 3705s did come out, he said, the Hasp workstations had no support under IBM's 3705 Network Control Program (NCP) and bisynchronous protocol wasn't good under IBM's NCP/Systems Network Architecture.

Hallmark is planning to upgrade the remote equipment and utilized IBM's Synchronous Data Link Control (SDLC) under Vtam rather than Btam because "IBM finally realized there is a market for data communications equipment and is beginning to supply it," Schmidt said.

The IBM 3705 II will give flexibility for normal and backup operations, he said, adding Memorex's 1380 front end is IBM-compatible, but the lack of Memorex software development and support for the machine are keeping Hallmark from obtaining the equipment.

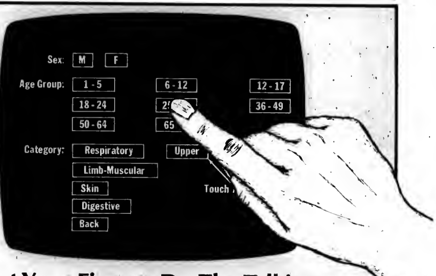
"But the Memorex 1270 hardware is the most reliable I've seen in my life," Schmidt said.

The main goal of the data communications system, he said, is to provide an information network that will keep all departments in the company aware of schedules and planning while maintaining efficient management control.

"Being on-line to our remote facilities provides numerous advantages. Effective management and control techniques can be implemented and administered on a timely basis, resulting in increased production and reduced costs.

"Another important factor is the improved communications between all departments in the company. Marketing, administration, manufacturing, inventory control, shipping, receiving and warehousing all have access to pertinent job information," Schmidt said.

"This lets them update themselves on a real-time basis and inquire about the status of particular jobs. As a result, schedules for critical holiday deadlines such as Christmas, Valentine's Day and Mother's Day are met in a timely manner."



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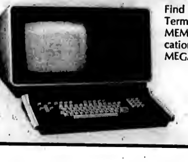

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POS System Helps Retailer Cover All Sales Angles

Special to Computerworld

BEAUMONT, Texas — The Fair, Inc., a chain of junior department stores, said it has gained a competitive edge in its trading area because of a rapid flow of information from point-of-sale (POS) terminals at 20 stores in Texas and Louisiana linked to a central computer at corporate headquarters here.

Terminal Transactions

In fashion, the faster a store can pinpoint the slow movers, the better the chances are for transferring the merchandise to a store in another market where it will sell without having to be marked down, according to D. Paul Cabra, vice-president in charge of DP.

The Fair's computerized merchandising information system dates back to 1970. At that time, mechanical sales registers at all stores produced tape as a by-product of recording transactions. The tapes were forwarded to Beaumont, where the information was processed with an NCR Century 200.

Soon after POS terminals became available, management at The Fair decided to replace the mechanical sales registers as quickly as possible. "We liked the system we had, but the idea of being able to process information in Beaumont the same day that transactions were made at the stores was intriguing," Cabra said.

The transition was accomplished in two steps. First, starting in May 1973, NCR 280 terminals replaced the mechanical registers at each store.

Initially, data collectors were used at the stores and the information was forwarded to Beaumont. Then each terminal was linked directly to an NCR 725 minicomputer at corporate headquarters. At the end of each day, the information collected by the minicomputer is fed to the larger DP system.

"From the start, we focused our DP priorities on merchandising," Cabra said. "It is customary for stores to put systems like accounts payable, payroll and receivables on a computer before they develop more sophisticated sales-related programs, but we did it the other way around."

First priority was given to improving inventory management. When a store knows how its merchandise is selling, buyers can make faster, better informed decisions, according to Cabra. "Pretty soon, you find that you are doing a better job of merchandising," he added.

The first impact was felt in automating credit sale authorizations. Previously, it took an average of two to four minutes for sales clerks to verify credit approvals for sales, Cabra said.

Now they enter the customer's credit card number into the terminal which immediately verifies his account's status with the minicomputer. If the salesperson gets a "green light," he completes the transaction. The only reason to pick up the telephone is if there is a question about the account.

This faster transaction time translates into faster service for happier customers and also frees floor personnel to spend more time selling, he said.

Improved Inventory Control

The next improvement was in the area of inventory control. The terminals provide input in two ways. The first is the traditional entering of product codes, sizes and price information for capturing and feeding into the computer at the end of each business day.

The following day, the buyers get a report of what is sold in every store by categories such as style and size.

Secondly, input is provided in the form of "280 flashes," a series of 99 code numbers that sales people can enter to describe each transaction made or not made.

There are almost 100 messages the salesperson or department head can send to the buyer through the 280 about an item such as a "hot seller," "slow mover," "needs to be marked down" or "damaged goods," Cabra noted.

"Our buyers receive information from each of the 22 departments in every store. This provides them with some timely reactions to what is in inventory," he added.

For example, a certain item may be noted as a hot seller at one store. The buyer can check his computer report and see where it isn't doing as well so the stock can be moved from stores that are not selling it to those that are.

The important thing is that the data is available on a daily basis. "Before, we sometimes found out weeks too late that a product was not selling. By getting information quickly, the merchandise could be reduced or returned to the vendor or

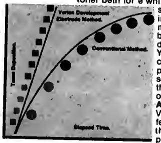
(Continued on Page 48)

The Fair salesman checks customer credit authorization through NCR 280 terminal.

"When you need it in black and white why settle for gray?"

With Printer/Plotters, as with any peripheral, *time* and *efficiency* are of prime importance. Considering today's manpower and computer expense, you want to get your output as rapidly and efficiently as practical. And, of course, "practical" means with useful, readable and accurate black and white results.

Given enough time, anyone can give you black: Just keep the charged paper in the toner bath for a while. But this is time consuming as well as impractical because too much toning increases background, and decreases readability. You want *extreme* contrast so the critical points are obvious . . . so they don't blend into their background and obscure the results.



As the graph indicates Varian gets you there faster and gets you there darker. A set of proprietary electrodes creates a series of even charges across the paper's surface where each dot will appear to deliver full, black dots—not just outlines or donuts.

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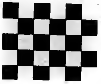

Actual size plot from Varian 4211.

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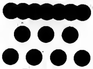

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Qantel Adds Printer Slave

HAYWARD, Calif. — The Model 4321 printer from Qantel Corp. makes hard copies from the company's Model 4011 CRT terminal or from data stored in a Qantel CPU.

The 45 char./sec or 300 line/min printer slaves tie into the CRT by taking advantage of the terminal's built-in logic circuits, Qantel said.

This reportedly allows printing instructions to come from the CPU or the terminal keyboard.

The Model 4321 is also capable of printing without displaying data on the CRT, leaving the display terminal available for other work, according to a spokesman.

The printer has a daisy-wheel printing mechanism which can he changed to obtain different type styles and sizes, he noted.

The 45 char./sec Model 4321 costs $7,450 and the 300 line/min version costs $12,500, he said from 3525 Breakwater Ave., Hayward, Calif. 94545.

Choice of POS System Not Problem— Not for Retail User That Designed One

BUENA PARK, Calif. — Because a retail user designed the forerunner of one manufacturer's point-of-sale (POS) terminal systems, the equipment selection process was an easy one.

In 1971, May Department Store Co. bought a subsidiary of Systems, Science and Software with the task of developing a POS terminal and software in mind, according to Jean Trull, assistant general manager of the May store here.

May developed the Mark 2000 terminal with the May Automated Record-Keeping system. After developing the system, it needed to market it and sold it to TRW Corp., Trull said.

TRW kept the retailer's basic software design, but added a buffer to the terminal; it also made changes to the hardware as well as major changes in the back-room minicomputer controller, she explained.

May's store here has been the pilot operation site for the TRW 2001 POS terminal system since its Sept. 29 installation and subsequent three-week system test period.

The 88 TRW 2001 CRT terminals installed here are connected to a store-level Data General Corp. Nova. The Nova is accessed through a teletypewriter for changes in price lookup tables and discounted items.

The store can generate its own reports through a Centronics Data Computer Corp. printer.

Terminal Transactions

Trull said she is particularly pleased with the classification reporting capabilities of the 2001, which allows item descriptions by up to 300 store departments, subdivided into another 22 groupings.

Classification reporting, Trull explained, enables store management to audit the sales of single articles, acting as a kind of market research tool.

"We have a more sophisticated analysis of where the sales are by classification and we're able to get the information to the department managers faster and better than we ever did before," she added.

"And, for the first time, the individual store knows more about where it stands than the headquarters store downtown. As sales activity increases, flash sales reports throughout the day tell us if we should call in more people to work or shift people within departments," she said.

The advantages didn't stop there, however. Last December, the terminals allowed the store to get through the holiday season with only three to five transactions lost out of 2,500, Trull said.

And the pilot site will save an estimated $150 each year per terminal — a total of about $13,000 — in paper supplies as a result of a shorter audit form and separate

(Continued on Page 45)

Soroc Designs Low-Cost CRT

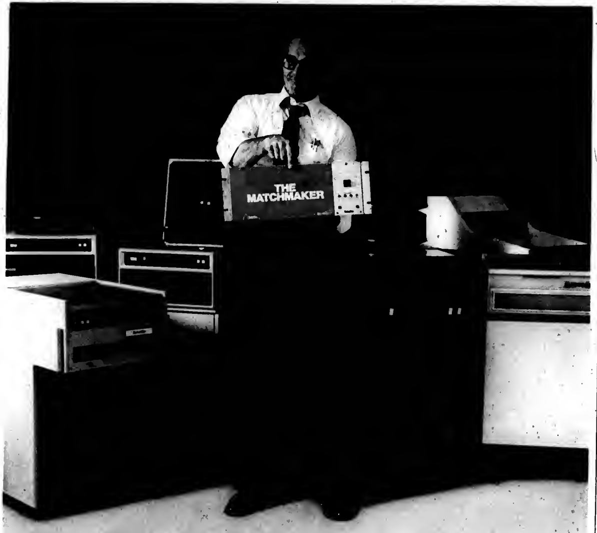
ANAHEIM, Calif. — Soroc Technology, Inc. has introduced a low-cost remote CRT/keyboard terminal with switch-selectable transmission rates from 110 bit/sec to 19.2 kbit/sec.

Soroc's IQ 120 was designed as an add-on for existing computer installations. The basic unit includes cursor control capabilities and a current-loop interface, according to a spokeswoman.

The IQ 120's 12-in. screen displays 12 lines of upper case text at 80 char./line densities, although a 1,920-character display capacity and upper/lower case characters are available as options, as is a formatting capability, Soroc said.

RS-232, printer and buffer interfaces are also available as options to the basic terminal, the spokeswoman noted.

The IQ 120 costs $1,380. Soroc is at 3074 E. Miraloma Ave., Anaheim, Calif. 92806.



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One for Other Vendors' CPUs

Harris Debuts Three CRT/Teleprinters

FORT LAUDERDALE, Fla.— Harris Corp. has brought out two CRTs with teleprinter capabilities for its S100, S200 and Slash series computers and a third for other manufacturers' CPUs.

Standard features of all three terminals — the models 2350, 8650 and 8660 — include 64 upper case Ascii alphanumerics displayed in a 24-line by 80-character format and a detachable keyboard, according to a spokesman.

In addition, the CRTs offer bottom-line character entry; cursor control; and full-duplex; asynchronous communications at 15 selectable speeds from 110 to 9,600 bit/sec serial or 10- to 960 char./sec parallel, he said.

Terminal Transactions

The Model 2350 comes with a Harris interface, controller and a 30-ft device cable. The Harris interface on the Model 8650 allows terminal connection up to 1,000 ft from the CPU.

The Model 8660, essentially the same as the other terminals, comes with an RS-32C interface for direct connections to non-Harris CPUs at distances up to 50 ft or remotely through modems.

Prices for the Harris-compatible models 2350 and 8650 are $2,450 and $2,100 respectively. The Model 8660 costs $1,950. Harris is located at 1200 Gateway Drive, Fort Lauderdale, Fla. 33309.

Unit Designed for Travel Agents

NORWOOD, Mass. — Raytheon Data Systems has expanded its line of intelligent terminal products with a microprocessor-based terminal system for small travel offices and travel agents requiring a display and printers.

The Model 1001 is capable of direct access to any airline host computer, Raytheon claimed. It has an 8-bit microprocessor that communicates with a host CPU via modem as a full-fledged programmed airline reservation system (Pars) interchange; a 960-character display with a standard airline keyboard; and interfaces for two printers, the company said.

The system will perform all the functions of a Pars and International Pars (Ipars) controller emulating the IBM 2946 or IBM 2948 subsystem; the firmware is stored in an 8K byte programmable read-only memory, according to a spokesman.

The purchase price is $4,750, Raytheon Data Systems said from 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

Choice of POS Not Difficult

(Continued from Page 44)

receipt and forms printers than the dependent operation on its own Mark 2000s, she said.

In addition, Trull anticipates savings in terminal maintenance because the hardware was designed to require a minimum of attention.

The terminals can operate in an off-line data capture mode if the Nova goes down, although there wouldn't be any lookup functions. In those cases, Trull said, the salesperson would have to key the price.

"Store sales policies are easy to enforce because the salesperson is prompted by the display," she continued. "On simple sales, the display isn't needed that much, but when it's a complicated transaction you haven't handled in a while, it's invaluable."

The store here doesn't have communications with TRW's 4000 computer system yet, but will be putting it in to transmit the retail sales information from the 2001s each night, Trull said.

At present, there is a circuit from the store to the TRW system for store credit authorization from the terminal's keyboard, she added.

Trull noted there were some problems with the terminals' off-line operation in December, but the on-site TRW personnel quickly fixed them.

"We're fortunate because we've been babysat by TRW," she said.

Adapter Permits Link With GPIB Systems

JERICHO, N.Y. — The Model 111 adapter from Systems Consultants, Inc. (SCI) reportedly permits any serially communicating RS-232C terminal or other digital device to be used with control systems utilizing the parallel format of the IEEE general-purpose interface bus (GPIB) standard.

The adapter is housed as a separate systems component and allows for two-way data transmission. It functions as either a transmitter, a receiver or both and can be used to adapt most equipment designed to RS-232 standards to control and processing systems using the newer GPIB format, SCI said.

The Model 111 costs $1,200 from SCI, which is located at 410 Jericho Tnpk., Jericho, N.Y. 11753.

743 KSR terminal...$1,395.
Uncompromising *Silent 700* quality...
at an unprecedented price.

The new *Silent 700®* Model 743 KSR data terminal is the lowest priced 30-cps printer terminal available today. And, true to its heritage, it combines all the popular *Silent 700* performance features . . . speed, reliability and quietness.

In fact, its speed and reliability are enhanced. Now there's true 30-cps throughput, because incoming data is buffered. Reliability is improved because its microprocessor logic means fewer circuit boards and components. This application of the latest design technology not only adds up to enhanced reliability but reduces size and weight as well.

As for quietness, the 743 KSR is virtually silent, as its name implies. Its non-impact electronic printing eliminates the disturbing noise associated with conventional impact printers.

At $1395* quantity one, the 743 KSR is another TI price/performance value leader... whatever your application: console I/O for software development, keyboard terminal for inquiry response, data entry, interactive remote computing, or a message network terminal.

OEM prices go below $1000* in large quantities; and attractive lease rates also are available. All *Silent 700* terminals are backed by TI's comprehensive worldwide maintenance and support services.

For more information on the 743 KSR and other *Silent 700* terminals, contact the nearest TI office listed below or contact Texas Instruments Incorporated, Digital Systems Division, P.O. Box 1444, Houston, Texas 77001. Or, phone Terminal Marketing at (713) 494-5115, extension 2126.

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*U.S. Domestic Prices

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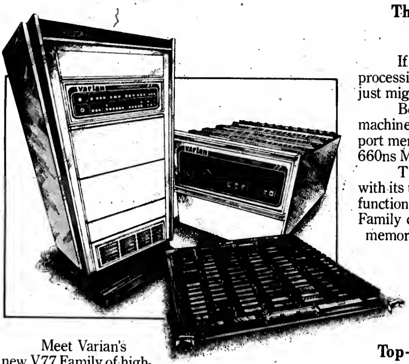
Introducing three new mini's that think like mainframes.



Meet Varian's new V77 Family of high-performance minicomputers.

Three distinctive new models. All fast. Each powerful. A family trio most mainframes can relate to. For help with almost any scientific, industrial, or data communications application.

The V77 Family delivers all the speed and performance you expect from Varian. Plus the unexpected, too. In the form of total family compatibility and shared memory capabilities. Up *and* down the family tree. For complete open-ended flexibility. In capacity and price.

The world's first mainframe-on-a-board. Our new V77-200.

Quite frankly, the new V77-200 delivers more computing power than any other computer-on-a-board you can buy. Handling up to 32K/16-bit words of 660ns MOS memory.

Big machine features include a fully microprogrammed architecture, an 8-register CPU, a 32-bit arithmetic capability, powerful set of 187 instructions, hardware multiply/divide, direct memory access, programmed I/O, real-time clock, and a teletype/CRT controller.

There's big machine performance, too. Example: multiplication functions handled in 4.9 microseconds—divide in just 8.

The new V77-200 means more cost-effective computing in many scientific, instrument control, or data communications environments.

The in-between that's a go-between. Our new V77-400.

If yours is a multiprocessing or distributed processing network application, our new V77-400 just might be "the tie that binds."

Because on top of all its standard big machine features, there's an incredibly flexible dual port memory. (With up to 256K/16-bit words of 660ns MOS memory in a single, standard chassis.)

The V77-400's dual port memory, working with its unique direct memory access system, functions as a bridge when linked to other V77 Family computers in closely coupled, shared memory multiprocessor arrangements.

An optional Writable Control Store is also available. Letting you expand the V77-400's instruction set to further improve the speed of both programming and program execution.

Top-of-the-line performance for almost any application. Our new V77-600.

Varian's new V77-600 sets new standards for all would-be high-performance mini's.

First, with a long list of standard big machine features. Second, with up to 1024K/16-bit words of 660ns MOS memory. And third, with a host of performance enhancing options. Including Writable Control Store, a floating point processor, and special scientific and commercial firmware.

For the ultimate in performance enhancement, an optional high-speed cache memory is also offered—cutting the V77-600's average execution time in half.

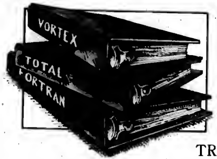
How our mini's speak fluent mainframe.

You won't waste any time or money training our new V77 Family how to communicate with your mainframe. Or developing your own control programs.

Because all V77 Family members utilize Varian's VORTEX (or VORTEX II) operating system—two of the world's best real-time systems.

Both systems permit concurrent job execution by allocating priorities. And help tailor other subsystems to fit scientific to commercial, real-time to batch, and stand-alone to data communications environments.

TOTAL, a highly efficient, network-type data base management system, is now available as a VORTEX II subsystem.

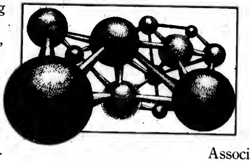


Usually found on only larger computers, TOTAL allows you to define and access your data base with powerful, high-level language processors like COBOL, FORTRAN IV Level G, and RPG-II. Opening the door to large libraries of already developed applications programs.

The benefits of a well-structured family.

Our new V77 Family represents more than just a continuing commitment to total hardware and software compatibility. Because it's a commitment to solving basic price/performance needs on several different levels.

For those needing more computing power, there's a V77 that's an affordable, high-performance solution.



For those wanting less wasted overhead, there's a less expensive, high-performance alternative.

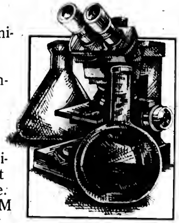
Plus an attractive new V77 discount plan designed to give even modest-volume OEM buyers a big break.

Finally, for those with special multiprocessing or distributed data processing requirements, there's an entire V77 Family. Specifically engineered to work well together—through shared memories, intercomputer I/O bus lines, and shared communications channels—as new cost-effective replacements for typical "patchwork" systems.

Varian. A commitment to innovation.

Varian Data Machines has played a significant role in the evolution of digital minicomputers for almost a decade now.

Consistently producing innovations not only meaningful to the industry, but to the end-user as well. A look at just the last five years tells the story...



In 1972, VDM developed the first minicomputer operating system with all the multi-task and file handling capabilities of a large computer.

A year later, VDM created the first microprogrammed minicomputer with a 64-bit Writable Control Store.

In 1975, two VDM firsts: a minicomputer with a data base management system equivalent to those for large computers, and, the first 64K word semiconductor memory package on a single board.

Today, it's the whole new V77 Family. Well-structured and ready. Breaking new ground in terms of Varian size, compatibility, and price/performance. Three new mini's that really do think like mainframes.

For additional V77 Family planning literature, contact any of the 38 Varian offices listed below, or Varian Data Machines, 2722 Michelson Drive, P.O. Box C-19504, Irvine, California 92713, (714) 833-2400. In Europe, contact Varian Associates Ltd., Molesey Road, Walton-on-Thames, Surrey, England, Telephone 28971.

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From Half n Hour to One Minute

CRTs Shorten Hunt for Records of Student Borrowers

ALBANY, N.Y. — Tracking the financial aid records of a single student on file here with the State of New York led record clerks on hunts lasting up to half an hour before the installation of an intelligent terminal network.

Now any one of the 1.3 million records can be called up by any of 11 CRT terminals in less than 60 seconds, according to David Perry, DP director for the New York State Higher Education Services Corp.

"In the eight months that we've had the system, we have managed to eliminate most of what was a tremendous backlog," Perry added.

The corporation now processes more than 600,000 grant, scholarship and loan applications during each academic year, disbursing nearly $450 million dollars in educational funds.

In the loan program, an average week will include the processing of 15,000 file updates as part of record maintenance, the posting of 12,000 interest-billing transactions and the accounting for 4,000 payments from students who have defaulted on their loans and are now making payments directly.

For the tuition assistance and scholarship programs, about 450,000 applications are processed annually, resulting in printed vouchers for each college listing the student's name, address and amount of the award.

All this amounts to 1.5G bytes of data stored in a three-processor Honeywell 6060 mainframe and accessed on-line using a PTS-100 programmable terminal system from Raytheon Data Systems. The CRTs are programmed to emulate the IBM 3270 Binary Synchronous Communications (BSC) line protocol and include a local printing capability.

"We mounted quite a search for just the right system," Perry recalled. "It took nearly eight months to evaluate all of the proposals we received from such companies as IBM, Applied Digital Data Systems, Inc. and Sanders Associates, Inc.

"The system was to be the first terminal network for any organization using the New York State Office of General Services' new Honeywell 6060 mainframe and would therefore set the stage for such installations in the future," he explained.

Terminal Transactions

The Raytheon system was selected after a week-long on-site demonstration during which two terminals were tied on-line to the Honeywell mainframe.

"A major consideration in the system selection was obviously cost," Perry continued. "But the biggest advantage as far as we're concerned is its speed. With our previous Honeywell 2000 system we made inquiries via two CRTs in a batch mode; now, since we're operating on-line, we can retrieve data files individually and within a matter of seconds."

The 11 terminals are interfaced via a dedicated line to the Honeywell 6060 by two New York Telephone short-haul 208A modems operating at 4,800 bit/sec.

The Office of General Services, owner of the Honeywell mainframe, is currently in the process of converting all current IBM mainframe users to the 6060. The Raytheon system is believed to be one of the first of its kind to interface a three-processor Honeywell 6060 with remote CRT terminals emulating the 3270 protocol.

The Honeywell system, which is currently being programmed for IBM 3284 printer support capability, features binary synchronous lines and a Honeywell Datanet 355 front-end processor. The software is Honeywell's Gerts and modified TDS in addition to the 3270 module, The Raytheon terminals are equipped with two local character printers.

Used for Verification

Each student file contains 12 to 26 separate data items such as account and Social Security numbers, current address, last loan, current balance, college code, bank code and year of graduation. It can be accessed with any of several pieces of data: name, account number or Social Security number.

Once displayed, the records can then be used to verify and edit any of the data items, change the account status, initiate action on an account and identify and delete errors, Perry said.

At present the terminal network is being used for verification of student applications, programming and limited time-sharing, with on-line data entry being explored as a future step.

In addition, a stand-alone two-terminal display station has been tied into the IBM 370/158 at the nearby State Department of Motor Vehicles (DMV). This station, the first non-IBM CRTs working with the DMV's total IBM system, was installed with no hardware or software modifications to the host, Perry noted.

The Raytheon CRTs, operating in emulation of the IBM 3275, are used in helping to locate "skips" — those students who have changed their residence.

POS Helps Retailer Cover Sales Angles

(Continued from Page 43)

reordered. Now we can make timely decisions," Cabra said.

Stock transfers have been simplified with the system, according to Cabra. The sending store enters the information through a terminal, and the recipient verifies the same way when the stock arrives. All the paperwork is handled electronically.

Besides the advantages in the speed and information delivery, it is more accurate, he said.

"Our competition keeps track of sale-priced items sold by counting the inventory before and after. The quantity to mark down is the difference in the number sold at the reduced price.

"They have no way of knowing if it might have been sold at the old price by mistake or if somethng was misshipped or stolen."

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Data Communications Dictionary

courier

cou-ri-er ter-mi-nal sys-tem/ 'kůr-e-ər, 'tərm-nəl, 'sis-təm/ n. [Est. 1969, Phx., AZ U.S.A.]:

A versatile family of communications devices compatible with any system supporting the 3270 without application software or operating system modification. **1. The 270 Information Display System. a: Terminals**—choice of 270 Display, 278 Mini-Display, and 275 Stand-Alone. **b: Controllers** — choice of local, remote, and the new Virtual Terminal Line Controller (VTLC). Both the local and remote controllers are available in redundant configurations. The VTLC relieves the mainframe of many remote line control functions. **c: Printers** — choice of printer speeds from 100 cps to 200 lpm. **2. Superior performance.** Equipment installed throughout the United States, Canada, Australia, Austria, Belgium, France, Germany, Great Britain, South Africa, Sweden, Switzerland, and The Netherlands. **3. Reliability.** Field service support worldwide.

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Controller

Printer

Mini-Display Terminal

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At Courier, we know the meaning of systems.

Bits & Pieces

Firm Seeks Participants For Data Entry Survey

SANTA ANA, Calif. — *Data Entry Digest* is conducting a nationwide survey of 1,000 data entry sites about the productivity of data entry equipment.

Keystroking and error rates for keypunch, key-to-diskette and key-to-disk equipment by manufacturer and application will be collected.

With the results, a user can compare his productivity rates against other users by payroll, accounts receivable, inventory control and other applications.

Anyone interested in participating will receive a free copy of the results, a spokesman said. Additional information is available from Research Department, *Data Entry Digest*, 10522 Ridgeway Drive, Santa Ana, Calif. 92705

Pericomp Has Tracking Tape

NATICK, Mass. — Pericomp Corp. has a 1/2-in. magnetic tracking tape which allows verification of correct 7- or 9-channel head tracking in forward and reverse directions or indicates necessary mechanical adjustments.

The tape is available in two lengths, 600 ft. and 1,200 ft., for $120 and $220 respectively.

Delivery is two to four weeks from the firm at 14 Huron Drive, Natick, Mass. 01760.

Printout Envelopes Offered

SOMERVILLE, Mass. — A variety of specialty envelopes custom-made to store or mail computer printouts is available from Ames Safety Envelope Co.

The firm is at 21 Properzi Way, Somerville, Mass. 02143.

Printout Ruler Has Magnifier

NOGALES, Ariz. — The Computer Printout Ruler incorporates a magnifier which identifies and projects desired printout information, according to its vendor, Pickett Industries.

Standard, metric and line units of measurement expand the versatility of the ruler which sells for $4.95, Pickett said from 386 N. Frontage Road, Nogales, Ariz. 85621.

Carousel Holds Media

ZION, Ill. — Microseal Corp. has introduced Carousel, a multiaccess and retrieval system for handling unitized microform, microfiche, cartridge magazines and cassettes.

Cost begins at $5,580 and varies depending on the unit selected. Delivery is five to six weeks, Microseal said from 2000 Lewis Ave., Zion, Ill. 60099.

Auerbach Suggests Alternatives

New Equipment Not Only Path to Savings

By Frank Vaughan
Of the CW Staff

PENNSAUKEN, N.J. — When faced with the task of cutting costs, DP managers often think of faster, more modern equipment. In a free booklet, Auerbach Publishers, Inc. suggested each facility has the capability to make many in-house changes that will result in effective cost cuts.

The booklet, "54 Ways to Reduce DP Costs," recommended some of the following cost-cutting measures:

- Eliminate preprinted forms. While the cost of custom forms in terms of total DP costs is not significant, that cost is considerable in the course of a year.
- Whenever possible, Auerbach suggested, users should modify existing programs to print the required page and column headings. Not only will this cut down on the printing costs, but it will trim the idle time required for operators to change custom forms, Auerbach said.
- Use paper wisely. This can mean making use of recycled paper; using the reverse side of scrap paper for compiles; making double use of paper, front and back, for internal DP use; using the lowest grade of paper possible; and selling the scrap paper.
- Reduce the frequency of reports. By running a report on the 10th, 20th and 30th of a month instead of weekly, those paper costs can be cut by over 25%.
- Check the formats of forms. By redesigning forms to eliminate unnecessary spacing between headings and in the body, savings of 10% can be realized.

Whenever possible, users should print multiple copies of a report on one-part forms rather than two-part forms. Although this may not always be feasible, it can make better use of idle printer time and reduce paper changeover costs, Auerbach explained.

Savings in Personnel Costs

DP managers can reduce personnel costs, Auerbach said, if they:

- Delay hirings. Costs can be reduced by postponing the hiring of new employees, but managers must be careful not to postpone the hirings so long that they cause delays and overtime.
- Reduce the staff. Some "judicious pruning" of employee rosters could result in significant savings, Auerbach said.
- Reward employees for recruiting new people. Auerbach suggested DP managers pay their own people instead of an agency. This will improve morale and staff members will rarely recommend "duds."
- Use programmers as operators. In an emergency, programmers who have a sense of responsibility toward the company will often help you, the publisher noted.

Operations using cards have many options open to them for savings. Auerbach suggested that such users:

- Convert to 96-column cards. If a single input record spans several cards, use of 96-column cards may reduce the number of cards required.

Even if additional columns cannot be used, 96-column cards are smaller and less expensive than conventional 80-column cards, the publisher pointed out.

- Put more than one record on a single card. Punch two or more records on a single card when less than half the card is normally used on an application.
- Mark-sense where feasible: A mark-sense card is capable of giving a greater accuracy and quality of input when the user fills in a mark than when the same user enters figures on paper that are subsequently keypunched, Auerbach noted.
- Input on magnetic tape. Key-to-tape is more cost-effective than card input.

In general, DP managers could:

- Use outside programming for small tasks. This option may cost less than having on-site personnel muddle through a problem in which they are not proficient, Auerbach said.
- Increase transmission speed from 1,200 to 2,400 bit/sec. There are many factors to consider with communications nets and this may even cost more, so users should check with an expert about their system and follow the advice.
- Watch hardware utilization. Users should monitor the utilization of their hardware and then eliminate, downgrade or change it as necessary.
- Alternate vendors. Savings are possible by going to third-party peripherals. There are drawbacks to this, so users should go slowly, Auerbach urged.
- Sell CPU time. If the user is not using the system's full capacity, it could be feasible to sell that extra time.
- Use reinked printer ribbons. For high-volume printers, this may be a quick way to save, Auerbach said, noting users may be able to reink their own ribbons at an even greater savings.

A free copy of "54 Ways to Reduce DP Costs" is available from Auerbach Publishers at 6560 N. Park Drive, Pennsauken, N.J. 08109.

MDS Has Two-Version Series 21 For Distributed Processing Use

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. (MDS) announced its Series 21 distributed processing system in two versions, a data entry system and an applications processing system.

The basic configuration for the system consists of an operator station with 1,920-character CRT and keyboard and a processor with one diskette drive.

The System 21/20 for data entry is preprogrammed for data entry and validation under control of user-supplied formats and is expandable to four operator stations, MDS said.

The System 21/40 for applications processing is programmable and can be adapted to a range of distributed tasks, according to the firm. The 21/40 is also expandable to four operator stations.

Two-Level Software

MDS developed a two-level software system to accompany Series 21. The first level, the Formatted Data Entry Program (FDEP), is a facility which enables users to convert existing data entry and media conversion formats from current equipment to the System 21/20 without programming or procedural changes, according to the vendor.

Level Two software, the Mohawk Business-Oriented Language (Mobol) permits customized programming, MDS said. Mobol programs which are executed on a System 21/40 processor are supported by both a compiler and an interpreter for program generation.

Other Series 21 software provides media conversion, diskette labeling and device control utility routines.

A basic system consists of a processor, one to four operator stations and one to four diskette storage units, each capable of holding 243,000 bytes of information.

As a user progresses to a full System 21/40, processor memory can be expanded to a maximum of 64K bytes, MDS said.

Options Available

Optional features include data rate operations to 9,600 bit/sec, a 45- or 150 char./sec printer and a 2.5M-byte disk drive.

A typical System 21/20 consisting of a processor, one operating station with diskette and diskette drive and dual station controller costs $6,270 or $160/mo including maintenance on a three-year lease.

A System 21/40 with all of the 21/20 equipment plus a memory expansion assembly and 32K of programmable memory sells for $7,660 and leases for $197/mo under a three-year plan with maintenance.

Initial deliveries will begin in May.

MDS is at 1599 Littleton Road, Parsippany, N.J. 07054.

Don't buy a DECwriter II until you see what DDI has to offer!

- New low prices— effective immediately.
- New DDI Combination Plan to increase your buying power.
- Faster delivery through larger inventories and new, expanded warehousing facilities.
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Responds to Clients 60% Faster

Utility Stops Fumbling Through Printouts for Answers

By Walter R. Boyce
Special to Computerworld

READING, Pa. — "Why is my gas bill so high?"

"Why don't we have heat?"

"The pilot light is out on my automatic water heater — when can you fix it?"

"Can you turn on our gas tomorrow?"

Such questions are typical of those asked by UGI Corp.'s 250,000 gas and electrical customers in eastern Pennsylvania. Not long ago, however, our local customer representatives needed too much time to respond effectively.

They had to fumble through stacks of computer printouts to find the right information, a process that was neither convenient nor efficient. Often, the only clue to the customer's record was his address.

Today, however, UGI can handle customer inquiries and service order requests in one-third the time with a computer-assisted Customer Information System (CIS) developed at our Gas Utility Division here. The system allows customer calls from each of four operating areas to be relayed directly to the Customer Information Center, also located in Reading, where operators can access a centralized data base through IBM 3270 CRT terminals.

Standardized data stored in an IBM 370/135 is structured to handle nearly all types of inquiries or service order requests from billing questions to disconnects. Even individual customer records are easy to find now — either by name, address or account number.

Two Systems in One

The system actually consists of two systems: CIS for rapid response to inquiries and a supporting batch Customer Accounting System (CAS).

CAS' main component is the master file or data base used by on-line and off-line functions alike. CIS is divided into five functional subsystems that can be implemented separately.

At UGI, we have implemented the two CIS subsystems we need most — computer inquiry and service orders. Inquiry permits access to the data base through the terminals for information on billing, payment, account status, outstanding service work and credit status.

Service orders lets us handle any type of service request and also allows remote printing of meter and appliance service orders by each UGI operating area.

CIS and its supporting data base helps us handle daily inquiries and service orders at least 60% faster than our previous method.

Ease of Development

Yet, for all the benefits, the most amazing aspect of CIS/CAS is the ease with which it was developed and implemented. Through the use of an IBM application development technique, we installed the system in a fraction of the time it would have taken to develop from scratch.

In only six months, using less than 24 man-months of effort, we implemented our two CIS subsystems with barely a snag.

After an extensive study of customer service needs, UGI elected in 1974 to centralize a number of functions and install a Customer Information Center here. We knew our proposed system would require conversion from batch processing to sophisticated data base/data communications techniques.

Not only would this mean rethinking and redesigning our basic accounting applications, but it would require consolidation or standardization of customer information in one centralized data base for access by remote terminals.

Specifically, the new system would require:

- Conversion from an IBM 360/40 to a 370/135.
- Conversion of related operating systems (DOS to DOS/VS).
- Migration from a strict batch processing environment to greater environment on data communications.
- Development of a new batch system to support CIS, consolidating gas and electric operations into one system.
- Design of a consolidated data base.

We were understandably concerned with these challenges. For one thing, we had little or no experience with data communications systems, and we wanted to develop our new system on a strict schedule, allowing time to develop new applications once CIS was implemented.

About this time, IBM announced its Application Design Service (ADS) — a planning-assistance tool created to ease implementation of CIS at public utilities. ADS provided a standardized design solution for both CIS and CAS as well as planning assistance.

Three persons handled the CIS development effort from October 1974 through April 1975. ADS was like a full-time consultant.

After deciding on ADS, we set up a task force to develop CIS and a review team to check its progress. The latter included representatives from our main business areas such as operations, sales and accounting.

The ADS package provided participating users with a detailed orientation of our planned system. Background material and prototype display layouts provided a common ground for understanding.

The rest was relatively easy. ADS gave us a head start in planning, organizing and designing our own system. For example, it provided detailed specifications for each data file along with general organization and content.

We could follow the organization and segmentation techniques, using recommended master records as checklists to develop our own records. The ADS logic module flow charts and accompanying narrative helped our programmers interface with CIS.

Consolidated Data Base

One of the most impressive aspects of our CIS/CAS system is the consolidated data base. Utilities traditionally use separate runs — and often separate files — for cash posting, bill calculations and other normal transactions.

UGI threw out all separate files and developed one massive data base. Everything af-

(Continued on Page 51)

Who needs these so

We used to be up nights trying to figure out a computer's bits and bytes. All because the right people at our computer supplier were never available. Their promises were no substitute for the support we needed. So we fired them!

We hired GRI. But, before we did, we talked to a lot of GRI's business systems distributors. They told us that the GRI System 99™ with its multi-programmable operating system, Interactive RPG II, and application programs was unbeatable. And, that GRI's service and support was always there when you needed it. 24 hours a day.

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DP Helps Heart Association Track Trained Rescuers

CHICAGO — Anne is "alive" because her rescuer was able to give her oxygen and an artificial pulse. He knew the procedure to help her and was able to effectively administer artificial ventilations and compressions in the critical minutes after Anne became unconscious.

Anne is a mannequin used by the Chicago Heart Association and its suburban divisions for training people in cardiopulmonary resuscitation (CPR). The trainee can practice the basic life support procedures on Anne until he perfects his timing and technique.

More than 3,000 instructors and instructor-trainers in Cook, Lake and DuPage counties are kept up-to-date on life-saving techniques by the Heart Association. They represent the beginning of a teaching structure that will be used to attain the Chicago Association's goal of having trained one in four adults in the three-county area in this life support technique.

To implement this program the association keeps an accurate record of these teachers plus some 30,000 trained rescuers on a computer system here.

Registry

The system maintains a registry of CPR teachers indicating their availability to teach and their teaching records. The computer identifies which instructors need to reapply for recognition.

An instructor must teach at least 40 people during the two-year recognition period and be retested by the Heart Association to remain qualified.

When an instructor is retested, "Recording Anne" is an essential part of the examination. The individual being tested must blow oxygen into Anne's lungs at a specified rate and compress the mannequin's chest in rhythmic movements. A recording device inside the mannequin traces a line on a calibrated paper tape.

The tape indicates if the trainee is using the proper techniqiue, pressure and timing. The procedure is repeated until satisfactory test results are achieved.

The first four to six minutes are critical in saving lives. Although the Chicago area has many skilled paramedics and others trained in saving lives, the average person on the street who is qualified in cardiopulmonary resuscitation can help keep victims alive until advanced life support personnel arrive.

Classifications

The Chicago Heart Assocation classifies people trained in CPR as rescuers (having basic skills) and instructors. Rescuers are a cross-section of the population who have had several hours training in the CPR, while instructors have received additional training.

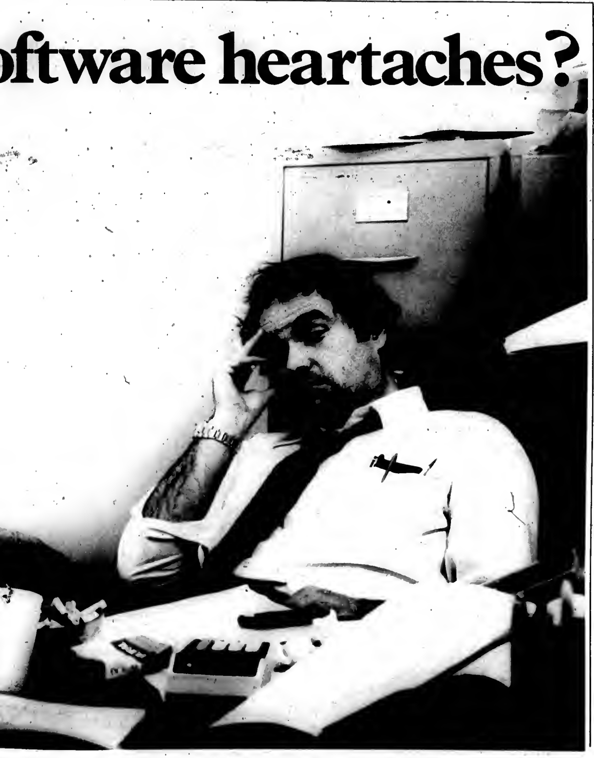
Instructors are frequently policemen, firemen, ambulance attendents, paramedics, nurses and doctors.

When the association needs information about an instructor, an operator displays the file on a terminal linked to an IBM 370/115. The record shows the instructor's age, home and business address, occupation, employer and teaching history.

The association's DP staff is building cross-reference files with the information to help pick out instructors. One file is organized by occupation (in case an organization wants a specific medical professional to teach a course):

Others are organized by employer and geographic location. The system is also used to prepare regular and special mailings to instructors.

Classes are held regularly in CPR in the three counties served by the Chicago Heart Association. The association hopes that more than a million people in the Chicago area will acquire the skills and knowledge, and it recommends that companies, civic groups and other organizations have members trained as instructors who can conduct CPR classes within their organizations.


oftware heartaches?

On-Line CIS Speeds Responses to Clients

(Continued from Page 50)

lecting the master file is processed nightly in one data base maintenance run.

The most important element of the data base is the customer master file. This was our greatest challenge and a classic example of how a planning tool can shorten the development process.

We needed a way to draw on various segments of the file for specific inquiries on our CRT terminals, and we needed the capability to search for a customer record by name, address or account number. ADS contained detailed specifications for each data file and a segmented file approach.

Our customer master file has 33 segments ranging from customer identification and accounts receivable status to 13 months of billing as well as complete servicer order and appliance purchase history. It contains information for every type of customer inquiry or service order request and offers a convenient way to find any customer's records — no matter how vague the reference.

The effectiveness of the customer file is partly a result of the degree of standardization it provides — a luxury we missed before CIS. Strict procedures can eliminate ambiguities and redundancies. Names are accurate right down to commas before "Jr.," and an asterisk after a "Rev." or "Dr." denotes that the term is a title rather than a person's first name.

In addition, addresses can be detailed right down to bungalow or cabin number, if appropriate. Every possible rural or residential address is identified with the aid of locality indicators that narrow the search process.

Currently, the Customer Information Center handles up to 3,000 calls a day. All calls during the day are switched to Reading and customers are unaware that they are talking to a remote operator rather than a local dispatcher.

All inquiries can be handled while the customer is on the phone, and callbacks are infrequent.

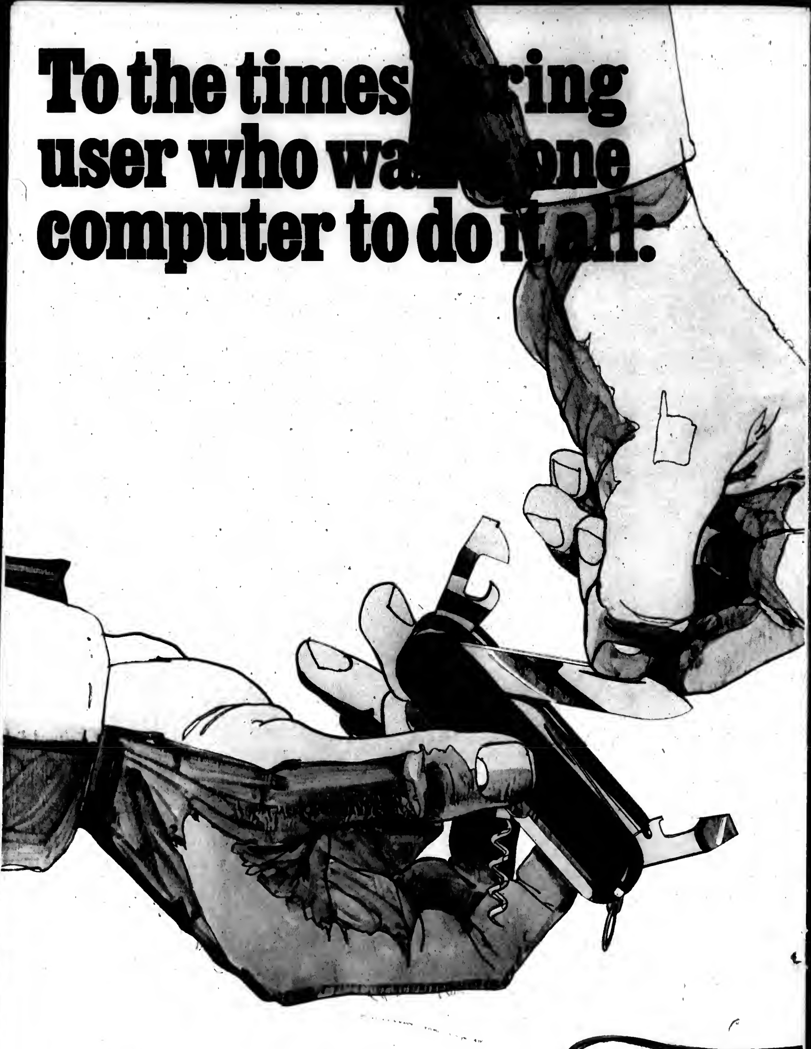
In addition, service orders generated by our central computer can be printed immediately by a remote terminal in a local operating area.

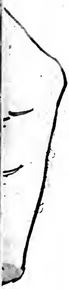
The system can currently handle 11 different inquiries via the CRT terminals. Three service order transactions also are possible — gas and electric orders as well as detail on past or scheduled activity.

CIS helps our customer service personnel respond more effectively to customer requests while handling more calls in less time. The basic results are better service with less effort and far lower costs — as well as a more satisfied public.

Boyce is the data center director at UGI Corp.

To the timesharing user who wants one computer to do it all.





Prime timesharing systems, like Swiss Army knives, are multifunctional, compact and easy-to-use. Both provide a collection of tools, each fitting a different need, all fitting together in one very reasonably priced, elegantly-engineered package. But a Prime computer, unlike the army knife, lets many people use all the tools all at once.

One Prime computer system has the right mix of tools. A family of program-compatible central processors, a broad range of input/output subsystems and a sophisticated interactive multi-user operating system are the starting points for selecting a system tailored to your exact applications mix.

One Prime computer system plays many roles. By providing virtual address spaces of up to 512 million bytes for each of up to 63 simultaneous users, up to eight million bytes of main memory and 2.4 billion bytes of disk storage, one system can be used for both interactive software development and computational processing.

One Prime computer offers many problem-solving alternatives. Any user can program in any mix of languages, including FORTRAN IV, ANSI '74 COBOL, BASIC, Macro Assembler and RPG II.

One file structure is used by all Prime system software. Thus, all Prime data management resources are totally compatible. User files managed by MIDAS, Prime's Multiple Index Data Access System, are interchangeable with common data-bases managed by DBMS, Prime's CODASYL-compliant database management system.

One Prime computer can do it all: complex simulations in FORTRAN, straightforward calculation in BASIC, text editing, transaction processing, massive number crunching and more.

Typical systems for computational timesharing applications range from $41,000 to $300,000, or about $1,300 to $9,800 per month if leased from and maintained by Prime.

To find out how one Prime computer can do it all for you, contact David R. Johnson, Business Manager, Prime Computer, Inc., 145 Pennsylvania Avenue, Framingham, MA 01701, (617) 879-2960.

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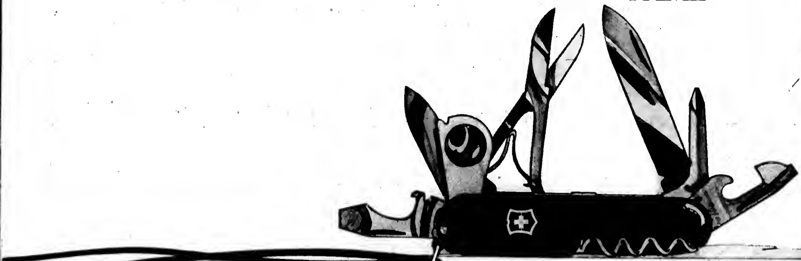


Prime can help

Microfilm Helps Memorial Maker Keep Orders Alive

PITTSBURGH, Pa. — Locating information on standing orders received years or even decades before was a time-consuming process that often took two weeks for the Identification Group of James H. Matthews Co.

The company, the largest manufacturer of cast bronze grave memorials in the country, maintains a file of more than three million documents.

In this line, each product is unique, according to Lee D. Yeager, office manager of the Memorial Division. Each memorial is cast to the specifications of the purchaser, who can select from a variety of decorative elements, type styles and sizes.

A memorial can be ordered with space for two or more names and dates, with only one space to be used immediately, for example. The other space is reserved for the survivor.

When it comes time to add the name and date to the other space, it must match the original in type size and style, Yeager said. Someone must then look up the original order and specifications before the production order can be issued.

Until a few years ago, all orders were kept in paper form. The files were so extensive that an entire floor in the company's headquarters building was practically filled with file cabinets.

Yeager devised a microfilm filing program based on automatic machine coding and retrieval. Each order and accompanying documents are filmed on 16mm microfilm with a Kodak Miracode II microfilmer.

At the same time, a machine-readable binary code is recorded on the film which identifies the customer name, purchaser name and order number of the document..

To locate a document in the microfilm file, a clerk inserts the proper film magazine in a Kodak Miracode II retrieval terminal and keys in all or part of the coding on the control unit.

The terminal then searches the film and stops at the first image coded with that number.

The order files often contain sketches and detailed specifications.

Bad Debt System Cuts Receivables

By Stephen L. Priest

Special to Computerworld

BROCKTON, Mass. — The Brockton Hospital, a 322-bed nonprofit general hospital, has reduced patient accounting man-hours and accounts receivable with computer-generated data-mailer dunning messages and "accounts referred for collection" reports.

A person with an overdue outpatient account was previously notified hy separate mail whenever his account was ready to be turned over to a collection agency. The procedure did not catch all overdue accounts and, as a result, accounts receivable contained many inactive overdue accounts.

Eighty man-hours per month — formerly spent handling voluminous accounts, screening overdue accounts and preparing notices — were eliminated by having the computer print one of five dunning messages.

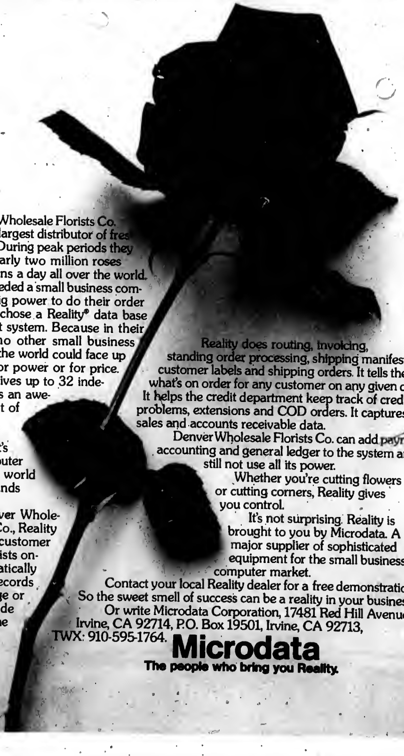
A dunning message is determined by a previous payment (such as "Your Insurance Has Made Partial Payment. Full Payment Is Your Responsibility.") or no payment since the last mailer ("Your Payment Is Overdue. Please Remit.")

An "Accounts Referred for Collection" report is also prepared weekly on the 32K NCR Century 200 for all outpatient accounts that are receiving the final dunning message. The report was designed to meet the required formats of the patient accounting and DP departments and the collection agency.

The system has been implemented 18 months and accounts receivable have been reduced by nearly 10,000 accounts ($420,000). The dunning messages and the collection report have thus streamlined the collection system, resulting in fewer man-hours necessary to handle low-volume dollar accounts.

The continuous form mailers used are a product of Moore Business Forms, Inc.

Priest is manager of data systems at Brockton Hospital.



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Learning Time Decreased

Technical Students Building English Skills With CAI

APPLETON, Wis. — Does the vocational student preparing for a future as a fireman, policeman, truck driver or specialist in food service need a sure grasp of the English language?

Officials at Fox Valley Technical Institute here think so. They believe basic communication skills are vital in any trade or occupation and have devised a computer-based method to help students sharpen these skills.

Fox Valley is a two-year technical, vocational and adult educational institute providing programs ranging from accounting to truck driving. The institute currently serves more than 5,000 full-time and nearly 30,000 part-time students.

Many of the instructional programs are competency-based and the institute turned to computer-assisted instruction (CAI) for its English courses.

Basic Communication

"Many students are taking advantage of CAI to build proficiency in basic English communication," according to Frederick P. Timm, a communications skills department instructor and team leader.

"Results so far are excellent," he said. "Most of the CAI users complete the normal 18-week communications skills program in 12 to 15 weeks and many in even less time. Each student can work at his own pace, concentrating on his own individual language problem areas."

The capability that enables a student and the instructor to isolate and identify particular weaknesses is one of the more important aspects of English communications skills.

As Timm explained: "Although the program is quite comprehensive and covers a broad range of English communications skills, it is structured in separate learning concept units, each of which is self-contained and largely independent of other units.

"A pretest feature built into the program allows the student to quickly pinpoint his strengths and weaknesses so his CAI learning activity can be directed where it is most needed and will produce the best results," he said.

Three primary communication skill areas are included in the curriculum: reading, language and program applications (writing, speech and specialized communications). At present, only one CAI learning concept unit is presented in the reading skills area. However, this single unit now is being pursued by a host of students interested in improving their proficiency in homonyms.

Three learning concept units have been developed for CAI use in the program application areas (i.e., letter writing, technical report writing and logical fallacies).

Language Skills Area

Language skills is the major CAI area, with a total of 36 learning concept units available to students. These learning concept units cover such content matter as capitalization, punctuation, nouns, pronouns, verbs, adverbs, adjectives, subject-verb identification, sentence patterns and structures and pronoun-antecedent agreement.

The structure here in the language skills area illustrates the modular, segmented approach that contributes so strongly to both the versatility and effectiveness of this program, Timm said.

The learning concept unit represents what the student must know about the particular subject matter in order to meet proficiency requirements. Each learning concept is associated with a number of specific learning objectives.

For example, the concept on personal pronouns encompasses 14 different learning objectives, including such specifics as personal pronoun involvement as subject or object, predicate noun or object of preposition.

Altogether, there are more than 400 different learning objectives associated with the 36 learning concepts. In addition, there are at least 20 test questions per learning objective, making a total of more than 10,000 test questions within the language skills area.

All data relating to learning concepts, learning objectives and test questions reside on a master file under control of IBM's Coursewriter III and running on Fox Valley Tech's 370/125 system.

The modular concept/objective units carry their own identity codes for retrieval by students at any of six IBM 3270 CRT terminals dedicated to CAI. These terminals are on-line and open to students from 7:30 a.m. to 4:30 p.m. each school day and from 6:30 p.m. to 9:30 p.m. Tuesday and Wednesday.

The student signs on to a terminal by entering an identifying number and the appropriate course name.

In a pretest and prescription mode, the interactive system will present selected questions from the question set associated with each concept/objective unit to assist the instructor in diagnosing the learner's strengths and weaknesses and then to prescribe a CAI learning sequence that will augment the identified weaknesses.

In a drill-and-practice mode, the system will interactively guide the student through a learning sequence. It will display discussion data, present multiple-choice questions, record the answers and log a full record of the terminal transactions and the student's performance.

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Source Data Collection Eases Handling of DES Claims

INDIANAPOLIS, Ind. — The recent surge in unemployment across the nation has brought rapidly increasing workloads to many state unemployment offices. One result, in Indiana, was the realization that procedures geared to normal benefit-voucher volume lost efficiency and accuracy under stress.

With equipment and data recording procedures recently installed to handle the increase, the Indiana Division of Employment Security (DES) now processes 160,000 claims a week with fewer errors and has reduced handling time and improved meeting of payment dates, the user said.

The equipment, Source Record Punch (SRP) data collection units and Zipcard claim voucher forms, both from The Standard Register Co., has been installed in more than 50 unemployment offices throughout the state. It replaced a system that incorporated optical scanning for obtaining computer input.

Embossed plastic identification cards carried by claimants were used to imprint constant information on forms which then were handled by optical character recognition units in the state's DP center here.

Problems arose when the reject rate of the optical scanning forms went to an 8% average and sometimes as high as 40%. Each rejected form had to be keypunched manually, adding time and workload to an already hard-pressed clerical staff and causing delays in getting checks out to the claimants.

Standard Register helped develop an SRP-based system in each unemployment office. The plastic identification cards were replaced with master tabulating cards to carry the basic claimant information in punched code.

This includes the claimant's Social Security number, quarter year, benefit year ends, weekly benefit and the local office code. The weekly benefit is determined by the type of program under which the claimant is being paid.

File Established

When a person registers for unemployment compensation, an interviewer completes a questionnaire and sends this to the DP center, where a file is established. Part of the output is a master card which is sent with a ledger card and jacket to the claimant's reporting office and filed by reporting day of the week and Social Security number.

A claimant's file is pulled when he reports for an interview. One of several two-part Zipcard voucher forms is then processed, depending on which program is involved..

Machine preparation of the form is simple: The master tab card is placed in the SRP's front-side slot and the Zipcard form is placed in the rear-side slot. The machines have keyboards for manual entries, but these are not required for a large percentage of the transactions.

Then the operator (the claims taker) hits the "punch" button, transferring information in punched code and printed characters to the Zipcard form.

From the master card come the Social Security number, quarter year, benefit year ends, weekly benefit amount and local office code. Internal slide switch settings provide the data and compensable week-ending date.

These two items may be changed as necessary by lifting the machine's cover and moving the slides.

Also entered automatically are the last three digits of the machine's serial number. These are wired into the machine to show which particular machine was used to handle the specific transaction:

Keyboard entries, when needed, consist of a code to indicate whether the claimant had any earnings in the week covered, the reduction in compensation made because of those earnings and a prior compensation week-ending date which, if used, supersedes the week-ending date entered automatically.

To prevent a mistake in the benefit amount, the claims taker enters it by hand, signs the form and then has the claimant sign. A paper copy is given to the claimant and the original card copy is filed for later batching and transport to the computer center.

The claimant's paper copy may be taken to his employer or union office for certification if Special Unemployment Assistance payments are involved.

All information entered by SRP units appears on the Zipcard form in both punched card and numeric characters. The form can therefore be used in two ways — as a man-readable action document for visual checking and reference and as a machine-readable medium for direct computer input, eliminating any intermediate keypunching operations.

When the card copies are received at the DP center, they can immediately be processed for input.

The interview conducted by the claims taker is comprised of obtaining answers to questions printed on the reverse side of the Zipcard form's card copy. The questions relate to the claimant's continued eligibility for unemployment compensation.

If a claimant files by mail, he must answer all of the questions and mail in the whole two-part form to the local office for validation and processing.

Four different two-part Zipcard forms cover the various classifications of claims — Straight Benefit Voucher, Benefit Voucher Extended, Benefit voucher Federal Unemployment Insurance and Benefit Voucher Combined Wage Claims. There also are two single-part forms for internal transactions, one to alert the Employment Security Division to a claimant who has worked for several employers and who is renewing his claim, the other to provide claimant information when an interstate claim is involved.

Input

The system provides input of all claimant data, with control in the local office. It also reduces the handling time of that data in the DP center here.

With the reduction of the error rate to a minimum almost all the reprocessing operations formerly needed to make corrections have been eliminated. This has resulted in an improved turnaround time from benefit voucher preparation to issuance of warrants and the reduction of time and effort-consuming work in central processing as well as the elimination of costly extra operations such as the generation of the plastic identification cards.

In a related operation, another model of the Source Record Punch unit is used to record data for the Employment Security Automated Reporting System (Esars), a subsystem of the federal Manpower Operations Data System.

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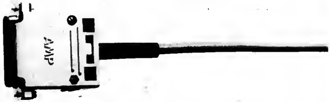

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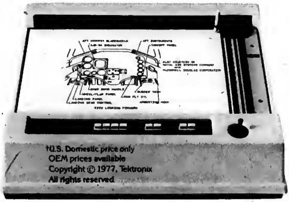

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Progress Report:

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They were events that might have forced some companies into bankruptcy. But not Cambridge. And for that happy ending, we have our 700 customers to thank.

In fact, our customers stayed with us to an extent which *has* been a secret — but which we would like to share with you now. Here are some facts:

1. In the past six months, we have shipped or booked more than 100 orders for memory equipment. That keeps us among the leaders in the add-on memory industry.
2. In the past six months, the average capacity per order increased to its highest level ever — just under 512K bytes. The average order a year earlier had been approximately 300K bytes.
3. In the past six months, we have begun shipments of 370/STOR 168, an add-on memory system for IBM 370/168 computers.
4. In the past six months, we have successfully field tested another significant new product at nine customer sites. It's a "Buffer Management System" which can be used with our own, or with other memory systems, and which improves the throughput of IBM 370/155 computers by up to 16%. You'll hear more about it soon.
5. In the past six months, we have received over 500 telephone calls at corporate headquarters from customers wishing us well, encouraging our tenacity, and ordering additional equipment.
6. In the past six months, user demand has enabled us to double our employment.

All of these events were precipitated by the people with whom we have done business. It says a lot for us, but it says even more for them.

And we haven't taken their confidence lightly. For our part, we've reduced our bank debt by 90% – to under $1.7 million from more than $17 million. We've successfully eliminated many costly overhead facilities. And we've returned to a positive cash flow.

In the meantime, little has slipped, except our record of consistent growth and profitability. And we are working hard to restore that right now.

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Mini Bits

MIC Plans April Seminar For Prospective Users

CHERRY HILL, N. J. — A seminar for business executives of small and medium-sized companies faced with the prospect of computerizing will be held here April 18 - 19.

Sponsored by Management Information Corp. (MIC), the workshop will cover topics such as DP fundamentals, alternatives for small businesses, dealing with a service bureau or time-sharing firm, software selection and selection of the right system, according to a spokesman.

Participants do not need any technical background to benefit from the seminar, MIC said.

The seminar costs $295 to subscribers of the company's *Small Business Computer News* and $325 for others, the spokesman added from 140 Barclay Center, Cherry Hill, N.J. 08034.

BST Offers IBM 3 Lease

SANTA ANA, Calif. — Business Systems Technology, Inc. (BST) now has a full system lease plan for the IBM 3.

The firm leases the CPU with BST peripherals and memory to users. For users who already have an IBM 3, BST either purchases the current system or another CPU and the necessary allied equipment and leases the system back to the user, a spokesman explained.

Leases are available for three or four years and IBM or BST equipment can be added to the system at any time during the lease, the firm stated.

Users can convert from a Model 10 to a Model 15 at 24 months into a 36-month lease, the spokesman noted.

Prior to the full system lease plan, BST leased individual peripherals or memory to IBM 3 users. BST can be reached at 3015 Daimler St., Santa Ana, Calif. 92705.

Topaz Has Line Regulators

SAN DIEGO, — Topaz Electronics has a series of AC line regulators designed to protect minicomputers against brownouts and severe voltage fluctuations.

The units come in power ratings from 600 Vac to 1,600 Vac with line cords and receptacles for plug-in operation, the company said.

Prices start at $265, Topaz stated from 3855 Ruffin Road, San Diego, Calif. 92123.

Superminis — Part 1

Large-Scale Minis Offering New Options

By Esther Surden
Of the CW Staff

A class of systems touted by vendors as giving users mainframe capability at minicomputer cost is emerging from the mini arena.

Along with the machines, a class of users with a special set of needs and skills is also coming of age.

What are these systems? Some call them superminis; others call them midicomputers. They are "best represented by the top-of-the-line systems produced by the minicomputer makers," according to a spokeswoman for Auerbach Publishers, Inc., a publisher of computer technology reports.

Two Groups

The superminis can be divided into two groups: those designed for commercial applications and those designed as general-purpose OEM-oriented systems.

In the former group are such systems as the Digital Equipment Corp. Datasystem 570 based on the PDP-11/70 CPU, the Data General Corp. Eclipse C/300 and C/330 and the Hewlett-Packard Co. 3000-II.

The latter group contains a large number of systems exemplified by the Interdata 8/32, Prime Computer, Inc. 400, Modular Computer Systems, Inc. Modcomp IV and the Varian Data Systems V77 Model 600, she said.

Generally, the large-scale minis support a great amount of memory, sometimes up to 1M byte. The systems also have multi-user-oriented operating sytems as well as operating systems that can operate in a variety of programming modes — time-sharing, batch and interactive, she stated.

Full-blown supermini systems have a price tag ranging from $200,000 to $500,000 and so appear to be cost-effective alternatives for users who are considering upgrading to a mainframe, the spokeswoman said.

This is the first article in a two-part series on large-scale minicomputer systems. Next week, in the second part, users of various business-oriented superminis will discuss the benefits — and pitfalls — of such systems.

But the cost can not be the only criteria for prospective supermini users. In the commercial area, "there are probably going to be some users who are not going to believe the [mini] vendor when it says, 'We really can't support you as much as IBM,' " she warned.

Software support from minicomputer vendors traditionally has been lacking, but as more commercial users get superminis, the demand for this support is increasing, she said. Many of the vendors are now attempting to fill this gap.

In addition, prospective business-oriented supermini users should realize not as many applications packages exist for the machines as for the mainframes. Thus the users will probably need some sophisticated in-house programming capability.

Growth Advantage

Growth is another area in which the mainframers seem to offer users more than minimakers, the spokeswoman added. Although DEC offers a mainframe system, most of the mini manufacturers do not.

The user can grow by pushing the system to capacity, off-loading to dedicated smaller minicomputers or obtaining a second system just like the first.

"If you look at the IBM 370/138," the spokewoman continued, "you'll find it is really a challenge from the mainframer to the very powerful but cheap midicomputers. It seems that the 138 would have an advantage in that it is heavily supported and the user has a place to grow."

Switch-Selectable Functions Available on Calcomp Floppy

ANAHEIM, Calif. — California Computer Products, Inc.'s (Calcomp) Model 142M is a multifunctional floppy disk drive with a six-position switch which allows user selection of certain key functions, the firm said.

Designed for use in both minicomputer and microcomputer systems, the drive will be especially helpful for systems designers, a spokesman claimed. The functions formerly had to be built into each drive, he noted.

Users can switch-select either hard or soft sectoring: gating of "write protect" or "ready" with select; stepper motor power control: and separation of data and clock, the firm stated.

Choice of Drive Format

Either IBM 3740 or user-selected formats can be chosen for the drive. The 142M performs as either a single-density, 243K-byte or double-density, 650K-byte drive, the firm stated.

The drive features a transfer rate of 500,000 bit/sec and has a 6msec track-to-track access time. It can accommodate 6,400 bit/in. with 48 track/in., the firm said.

Options include a range of power selections, a signal line terminator connector in the drive and an auxiliary power connector on the circuit board, Calcomp noted.

The unit, plug-compatible with the firm's other floppy disk drive offerings, costs $625 for a single-density system, the firm said from 2411 W La Palma Ave., Anaheim, Calif. 92801.

Mini Helps Keep Firm Moving

BURGETTSTOWN, Pa. — A moving company here is keeping tabs on shipments to various countries with the aid of a minicomputer.

Ocean-Air International, Inc. specializes in moving the household goods of corporate employees transferred overseas. In one year, the firm handles about 1,200 moves; an affiliated company, Starck Van Lines, handles about 3,000 domestic moves each year.

The tracing system is one of the most important functions of the firm's minicomputer, according to Richard Starck, president of Ocean Air. It allows company personnel to answer inquiries about the status of international shipments.

When an order is received for an international shipment involving, for example, the move of a U.S. Steel executive from Pittsburgh, Pa., to Johannesburg, South Africa, the job is given a registration number which is entered into the data base. Then, as pertinent information such as the cost estimate and pickup date is received, it is entered

(Continued on Page 61)

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The Missing Link

The HP 3000 Series II closes the gap between the small business system and the big central computer.

Until recently, that gap was a real problem. For small to medium-sized companies the cost of a big computer was prohibitive. But there was a growing need for extensive batch processing and real-time information management.

Today, the HP 3000 Series II fills that need. A fast, powerful general purpose system, it can handle a wide variety of computing modes at the same time. Yet system prices start as low as $110,000 (U.S. domestic price).

A versatile operating system is the key.

Our Multiprogramming Executive allows the system's resources to be used concurrently. While batch jobs are running, several users can interact with the computer on a time-share basis via terminals (either hard-wired or over phone lines).

Operating speed is maximized with firmware-assisted software. And spooling, standard on all models, keeps the peripherals working at top speed.

Our system has virtual memory, giving you the flexibility to run large programs with a relatively small real memory. And with batch plus terminal capability, you can develop programs at a terminal using our interactive EDITOR—then run them unchanged in batch mode for production work.

The HP 3000 is fluent in COBOL, RPG, FORTRAN, BASIC, APL and SPL (our ALGOL-like Systems Programming Language). These are high-level languages, which the operating system treats alike. The same simple control language statements let you use any programming language.

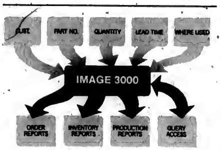
Data Base Management: another "big computer" advantage.

IMAGE/3000, our DBM software package for this system, gives you the means to create and manage a data base. And our simple English-like inquiry language, QUERY, lets you access your data base easily.

You can compile reports, make casual inquiries without writing programs and update data on-line. You can generate forms, titles, page and column headings, data sorted by categories, subtotals, totals and averages.

IMAGE has proved to be such a useful DBM capability that it was named to the 1976 Datapro Software Honor Roll. This places it among the 38 top software products, and one of only three DBM packages, among 1447 rated by computer system users throughout the country.

The software was judged in six categories: ease of installation, throughput efficiency, vendor support, ease of use, documentation and overall satisfaction.



Turning raw numbers into usable information. *All the tools for data base management are provided by our IMAGE/3000 software package and English-like QUERY inquiry language.*

We've made our data management capability even more useful with the addition of KSAM (Keyed Sequential Access Method), giving you fast access to indexed sequential files.

Hardware advances add speed and reliability.

HP's "fault control memory" keeps the CPU running at full speed, even when a memory circuit has failed. Five error-correcting bits in every 21-bit word determine where a fault has occurred and the system compensates for it. A RAM automatically stores the information about the faulty chips. When our Customer Engineer arrives for regular maintenance, he calls up a status report and replaces any faulty circuits—even though everything has been running fine as far as you're concerned.

Fast (350 ns access) semiconductor memory is used, making the CPU easy to expand. In fact, you can go from 128K bytes of mainframe memory to 512K bytes, depending on the system you choose. And disc capacity ranges from 15 to 400 megabytes.

At the heart of the CPU is a 32-bit bipolar ROM-based microprocessor. It contains 209 firmware instructions that execute many system operations normally left to software. This microprogramming speeds up such recurring operations as moving character strings from one location to another, scanning strings for a particular character and environment switching. Processing interrupts and linked list searches are also implemented in microcode, relieving the operating software of considerable overhead burden.

With its power and versatility, the HP 3000 is a natural upgrade for companies outgrowing their small business computers. If you'd like to see it in action, call your nearest Hewlett-Packard office listed in the White Pages. Or write to Bill Krause, Hewlett-Packard, 11000 Wolfe Road, Cupertino CA 95014.

HEWLETT hp PACKARD

Handling big business problems on a small computer.

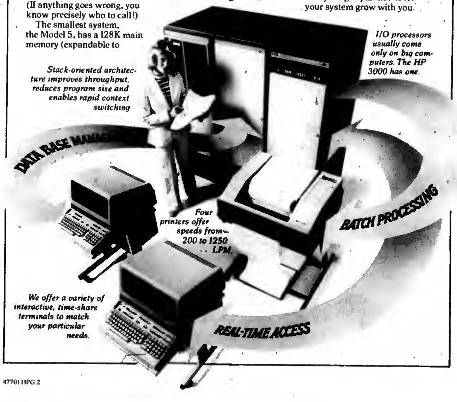
With a throughput two to six times greater than the original HP 3000, the Series II is designed to handle batch operations and multi-terminal on-line computation simultaneously.

All components of the system are supplied by Hewlett-Packard, which assures maximum compatibility and minimum service problems. (If anything goes wrong, you know precisely who to call!)

The smallest system, the Model 5, has a 128K main memory (expandable to 256K), plus a 15 megabyte moving-head disc, a 1600-bpi magnetic tape unit, an HP 2640B CRT terminal and a 16-port asynchronous terminal controller.

The Model 7 takes you to 192K bytes of main memory (expandable to 256K), with two 47 megabyte discs, IMAGE data base management, COBOL and RPG. The Model 9 has 320K bytes of main memory (expandable to 512K). IMAGE and five programming languages are standard.

Any configuration can be enhanced with the addition of line printers, card readers and punches, terminals, discs, tapes and more main memory. Everything is planned to let your system grow with you.



I/O processors usually come only on big computers. The HP 3000 has one.

Stack-oriented architecture improves throughput, reduces program size and enables rapid context switching

Four printers offer speeds from 200 to 1250 LPM.

We offer a variety of interactive, time-share terminals to match your particular needs.

47701 HPG 2

Sweater Firm's On-Line System Styled Just Right

NEW YORK — When an organization is in an industry as volatile as apparel, an in-house system is almost a necessity, according to Allan Guttman, co-founder of Miss Erika, Inc., an importer of ladies' sweaters.

The 10-year-old firm has sales of about $10 million a year to some 3,500 accounts. With about 1,850 styles and colors involved, the firm has many variables to track in order to buy correctly.

About two years ago, the company decided to move away from its manual operation and contracted with Burroughs Corp. for a dedicated batch-oriented turnkey system. Programming was to be done by a vendor-chosen programmer, Guttman explained.

Before the turnkey approach was chosen, Miss Erika considered going with a service bureau. But "the bureau can't take the 'dirty work,' just the clean items without complications," he said.

"We still would have to handle the enormous problem of reconciliations on returns and allowances, which is about 90% of the problem. And it also would have been more expensive than going in-house," he noted.

The batch system did not work out, Guttman said, primarily due to the programming, but the firm was still sold on the turnkey system concept. An on-line system was the alternative and after considering systems from several companies, including Wang and IBM, the firm decided on a Micos system from Mini-Computer Systems, Inc. The system was chosen because the vendor had experience in the apparel industry.

The system handles billing, order processing, inventory control, accounts receivable, accounts payable and sales analysis. It produces more than 30 daily, weekly and monthly reports, including some unique to Miss Erika.

For example, the company has a policy of initially accepting all customer credit claims for bookkeeping purposes, pending verification, so the accounts reflect the most conservative position possible at any particular time, Each claim is eventually verified and the company will invalidate the claim if it believes it is not justified.

"The most significant fact is that the system is on-line," he pointed out. "We can determine at any time what a customer owes and what merchandise is on order to the customer. A printed copy is not vital. You just look at the screen — even while the customer is on the phone — and you get the information. This is an advantage in the apparel business."

A primary reason for the success of the system at Miss Erika was that after the initial failure with the batch method, the company knew exactly what it wanted and was ahle to guide the vendor very closely.

On an average day, the system processes 150 orders with five items each, 300 invoices with four items each and 50 payments of six items each. As an example of the strides over the previous manual methods, Guttman cited the special weekly reports required by Sears, Roebuck, a major customer. It used to take one person about seven hours to prepare the reports each week, compared with about seven minutes today.

To date, Miss Erika has assigned three people to operate the system. All were already employed by the firm, but none had data processing experience.

The system includes a CPU with 64K of memory, three video display terminals, three 10M-byte disk drives and a 600 line/min printer.

Overseas Shipments Moving Firm Tracks

(Continued from Page 59)

into the data base.

When the shipment is picked up, this fact is entered into the data base and the shipment is recorded as being en route to a port, such as Baltimore.

When the goods arrive at the port in Baltimore, Ocean-Air personnel use a number of programs to pull information from the data base for compiling the required shipping documents. These include letters of instruction to the destination port agent and letters to the South African shipping agent notifying him that a shipment is to be expected.

The sailing date, the name of the ship and the estimated time of arrival in South Africa are all entered into the data base at that time.

When the cargo reaches South Africa, Ocean-Air's agent notifies the company via Telex that it has been received and indicates when it is to be delivered to the residence or if it is to be placed in storage.

Ocean-Air's tracing system produces weekly reports on the progress of each shipment for customers and daily reports for company use.

"We're able to provide more efficient service to our customers because of this system," Starck said. "Previously, we kept track of shipments with written reports which were manually filed.

"If someone called to check on the status of a shipment, we almost always had to tell the customer we would call back after we retrieved the information. Now we go to a terminal, get the data and give the customer an answer while he's still on the phone."

Pinpoints Shipment Location

In addition to pinpointing the location of the shipment, the company can continually update the estimated cost of the move as invoices are received from various companies handling the cargo and the information is entered into the data base. Adjustments in insurance coverage can be made easily, Starck noted, with coverage being extended, for example, when a shipment is placed in storage.

Eventually, Starck said, Ocean-Air hopes to link the system up with Telex to give the company's scores of overseas shipping agents ready access to the data base.

The firm is using two Hewlett-Packard Co. (HP) 3000s with 128K memory, 15Mbyte disks, 800 bit/in. drives, a 300 line/min printer and six terminals.

The first system is used as the tracing system and for accounting while the second is used to provide time-sharing to outside users, according to Starck.

The firm replaced an IBM 3/6 with the HP system about a year ago. "We ran out of capacity on the IBM 3 and, although we looked at the 15, it was too costly," Starck said.

The firm decided on the HP system on a price/performance basis, he added.

Ocean-Air hopes to put the tracing system on-line for the domestic moving company as well. The system presently handles analysis of the rate structure and claims for damages for that company.

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Minicomputer Exchange

David's Expectations Unrealistic

Software Packages Imperfect, But Cheap and Flexible

By David V. Whitaker
Special to Computerworld

I read Jon David's article "Software Packages Must Fit Exactly," [CW, Jan. 10] with great interest and, I admit, some degree of amazement. Being in both the packaged and custom software market for business minicomputers, I found the author's premise quite contrary to my experience and to industry direction.

David's exhortation for exact compatibility of package software for a business operation was somewhat like admonishing a child to never say "never."

"Exact" is an ambiguous word which can rarely be applied to software applications. To find a package which will meet a user's requirements 100% is almost impossible, except in a very few instances, because package software is not and can not be designed to fit perfectly into every user's business. It is intended to provide a comprehensive generalization of a particular area's needs.

Admittedly, packages vary widely in their ability to satisfy user demands, and in this respect David's warning was appropriate, but only if tempered with a true evaluation of the package performance in relation to economic considerations.

Less Than Perfect

Generally, packaged software which accomplishes 90% to 95% of a user's desired results may be considered adequate depending on such factors as the cost of custom replacement and implementation agonies.

For example, consider the potential user who is contemplating a minicomputer system with a projected five-year cost of $60,000 with $10,000 available for a software package which provides him with 95% of what he wants. And assume a custom system would cost $25,000 to develop and implement.

Is it a wise business decision to increase the system cost by 25% to achieve a mere 5% improvement in performance? I believe not, and industry experience supports that.

Questions Involved

In addition, how long will it take to develop and implement a custom system? Who will design it? Who will support it? And will that custom software still meet 100% of the user's needs in future years? No one can be exact in responding to these questions.

Can we therefore expect a software package to be exact in responding to business requirements if custom software itself is less than exact?

Package Advantages

Further, packaged software offers many advantages at the entry level. It is usually more reliable, having undergone more extensive testing and real environment scrutiny than any one-time custom software product.

Regardless of the source of the package (custom or predesigned), it is reasonable to assume more consideration was given to incorporating modularity and flexibility. Certainly, continuing support for package software is more readily available than for custom systems.

In addition, very few businesses have stable requirements, and the rare custom software system whch gives 100% today will most assuredly provide considerably less as future requirements change.

Readers are urged to reply to this or any other Minicomputer Exchange article. This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area. Letters or manuscripts should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space, please.

The same is true of a packaged system. However, it would probably be more adaptable over the life of the system and would accommodate adjustments more readily than custom products.

While due caution should be taken to assure adequate performance before purchasing any software package, in general such packages can provide satisfactory results at substantial cost savings. Relatively few sacrifices are demanded of the user (especially concerning a mini system in which software cost can represent a comparatively high percentage of overall system cost).

As the minicomputer industry moves rapidly toward ever-increasing sophistication in hardware, we in software support must acknowledge and respond to the growing need for viable, efficient and economical packages.

David Whitaker is a systems consultant in Virginia Beach, Va.

Tape Drives Extend Storage of HP 9825

PALO ALTO, Calif. — The Hewlett-Packard Co. (HP) 9825 desktop system has been enhanced with an external tape system which offers four tape drives in a single unit, the firm said.

The 9877A tape system provides 250K bytes of additional memory or up to 1M byte with the four-drive options.

More Memory

It can be used with the 9825 in applications which require more memory than the 9825's built-in tape drive provides, HP noted.

The 9825 equipped with a 9877A can be used in the fields of research and statistics, as the controller of an instrument system, for pilot process control applications, for remote data collection, for production control and for information management, HP said.

Prices for the 9877A are $2,340 for the one-cartridge version, $3,065 for the two-cartridge version and $4,330 for the four-cartridge version, HP said from 1501 Page Mill Road, Palo Alto, Calif. 94304.

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600 Series hardware is modular and upward expandable, allowing selection based on individual site performance requirements.

Our field-proven software provides for the traditional data processing requirements as well as a full range of communications emulators. A few of the features offered by each family member include: file inquiry, retrieval and update capabilities, terminal and system security, both batch and interactive communications, as well as Entrex's sophisticated data entry software.

Entrex is ready with a family of systems particularly suited to capturing and processing data at the source; a system alternative that can be implemented today, yet provides for tomorrow's growth; a system family that offers the network planner total flexibility in configuration planning.

Disks Expand Storage of Harris Minis

FORT LAUDERDALE, Fla. — Harris Corp.'s Computer Systems Division has introduced two high-capacity disk storage modules for use on its S100 and S200 systems.

The disk devices offer 150M- and 300M-byte storage, according to a spokesman. Multiple disk subsystems permit data bases in excess of 1G bytes, he added.

Storage modules can be added to both the 150M-byte Model 5540 and 300M-byte Model 5550, he noted.

Standard Features

Standard features on the devices include a controller; a data transfer rate of 1.2M byte/sec; an average latency of 8.3 msec; an average access of 30 msec; and alternate error sector flag addressing, Harris said.

Prices for the models 5540 and 5550 are $40,000 and $50,000 respectively, which includes a disk pack with 19 storage surfaces, controller and interconnecting cables.

Prices for the second storage module drives are $30,000 for the 150M-byte Model 5541 and $40,000 for the 300M-byte Model 5551. Disk packs for all models are listed at $2,500 each.

Deliveries are scheduled to begin next month from the firm at 1200 Gateway Drive, Fort Lauderdale, Fla. 33309.

AED Has Interface for Diskette

SUNNYVALE, Calif. — Interfaces to allow various minicomputers to link to Advanced Electronics Design, Inc.'s (AED) double-density diskette system are available from the firm.

The double-density diskette can be used in applications where a hard disk is not really justified but random access and increased diskette performance are needed, AED said.

The diskette holds 5,000 128K-byte records, the firm stated.

Available for Digital Equipment Corp. LSI-11 micros, the unit is supplied with a direct memory access interface and RT-11 driver to licensed users of that operating system. The driver costs $400; a two-drive diskette unit costs $3,900 including interface.

For DEC PDP-8 users, the OS-8 driver costs $850; for Hewlett-Packard Co. 2100 users operating under the RTE-II or RTE-III operating system, the driver costs $850.

For the HP minis, the system offers users an alternative to applications where heavy swapping of program modules is not required, the firm said.

AED can be reached at P.O. Box 61779, Sunnyvale, Calif. 94088.

Monroe LCC/60 Handles Accounting

MORRIS PLAINS, N.J. — A desktop accounting calculator designed for small and medium-sized businesses is available from Monroe, a division of Litton Industries.

The LCC/60 Ledger Card Computer is a desktop unit designed to handle invoicing, accounts receivable, general ledger, accounts payable and payroll applications, the firm said.

It is in the range of the Olivetti 85 series, Burroughs L series and NCR 299, the company stated.

Programmed by Vendor

The unit is programmed by the vendor to suit the specific needs of each user's application, according to a spokesman. It contains up to 118 registers and 1,800 program steps with 57 variable commands available, he added.

An alphanumeric keyboard is used for data input and a 10-key numeric pad and function keys activate stored functions. Programs are contained on cassettes, the firm added.

Accommodates Forms

The LCC/60 can accommodate "almost any type of form" and features a 17.7-in. multiposition split platen so the operator can process more than one form at a time. It prints at 60 char./sec, the spokesman stated.

Forms feed features include power rear feed and front feed. A tractor feed for continuous forms is optional, a spokesman said.

The LCC/60 is available in three basic models. The LCC/60-1 with 22 memory registers costs $7,695, the LCC/60-2 with 52 memory registers costs $7,995 and the LCC/60-3 with 118 registers costs $8,495 with one application package.

Additional applications and customized programming are available, the company said from The American Road, Morris Plains, N.J. 07950.

Schools, Businesses Get Mini From Terak

SCOTTSDALE, Ariz. — Terak Corp. has introduced a disk-based minicomputer aimed primarily at educational and small business users.

The 8510, built around a Digital Equipment LSI-11, was designed to function as a stand-alone alternative to time-sharing systems and as an independent satellite terminal in networks.

The system incorporates a disk controller which can handle up to four drives, single serial interface circuitry (RS-232C), power supplies and 4K- to 20K words of MOS read/write memory.

Options include hardware multiply, divide and extended instruction sets, an additional serial interface, a parallel interface, a printer controller and a multiple interface board with four serial interfaces and a printer controller.

Software available includes Macro Assembler, single and multiple user Basic and Fortran IV, as well as Digital Equipment Corp.'s RT-11 and Terak's AG-1 business application generator.

Third-Party Maintenance

Maintenance is through third-party firms.

The standard 12K-word machine with a single serial interface is priced at $6,615.

A complete small business system including a processor with 20K words of memory, dual flexible disk drives, 19.2 kbit/sec keyboard/CRT terminal, 300 line/min printer, disk operating system and Basic software lists for $16,465 from the vendor at Suite 100, 14425 N. Scottsdale Road, Scottsdale, Ariz. 85260.

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Replaces Use of Service Bureau

In-House Mini Saving Electric Co-Op $2,000/Mo

By Bruce Moysey
Special to Computerworld

RIDGELAND, S.C. — Palmetto Electric Cooperative, Inc. is currently saving about $2,000 in monthly DP costs with the installation of an on-line turnkey system.

About a year ago, Palmetto replaced the on-line service bureau it was using with the Realtime Electrical Cooperative Accounting and Control Technique (React) system for its general business needs. Supplied by the Digital Systems Division of Computerecords, Inc., a local DP firm, the system is based on a Digital Equipment Corp. 350 Datasystem and includes 64K bytes of memory, 40M bytes of disk memory and a 300 line/min printer.

The system also has three CRT input terminals operating on-line; one of the CRTs is located in a branch office in another town.

All input is done interactively using on-line editing of data as it is being entered. This approach has increased the accuracy of the final results. Real-time updating of files is another useful feature and with on-line inquiry, information is readily available to answer questions.

Menu-type selection of printed reports is a standard feature of each application so the user can select the specific report or combination of reports desired at a given time. Operator "lead-through" has minimized the time required to train new input operators.

The total package included the computer and applications software as well as complete training. The vendor provided user manuals that were easy to understand; data file conversion was included in the total package and constant support for modifications and new applications is available.

The applications software contains a financial system which conforms to both Federal Power Commission (FPC) and the Rural Electrification Administration (REA) standards. The overall system includes consumer billing, capital credits, payroll, inventory of material and supplies, accounts payable, cost accounting, work order reporting and general ledger.

Since the turnkey package totally encompasses Palmetto's needs, the company has not hired any programmers or any additional personnel of any type.

Because it is operating a sophisticated, on-line, real-time DP system with no significant problems at less cost than the service bureau, Palmetto has become a great believer in the turnkey concept. It is an ideal approach to obtaining results at an absolute minimum cost.

Moysey is general manager of Palmetto Electric Corp.

Turnkey Eases Loan Processing

By Esther Surden
Of the CW Staff

GLENDALE, Calif. — Quick processing of volume business with fewer people, a goal shared by most minicomputer users, was achieved by Fidelity Federal Savings and Loan Association here in its loan-processing department.

"Normally, the one operator using the system can produce about 20 loans in a single work day. Manually, the same type of processor would be likely to complete about three loans a day," according to Paul B. Devlin, assistant vice-president.

"It has increased the number of loans we are able to process with less people," he added.

The turnkey minicomputer system was installed at Fidelity about a year ago. It is based on a 32K Data General Corp. Nova 1200 with 10M bytes of Diablo Systems, Inc. disk, a Diablo printer, a Datamedia Corp. CRT and four additional terminals connected via multiplexer, Devlin said.

The system was designed hy ECO Methods, Inc. of Manhattan Beach, Calif., and supplied with that firm's Document Preparation software and operating system, he added.

Conducted Systems Study

The institution made the decision to computerize and then made a study of existing systems used by savings and loan associations in California.

"We had been approached by the Nixdorf people and we also took a look at the Burroughs equipment that was being used by a number of associations. Then we heard of this particular system which was fairly new at the time," Devlin explained.

"We investigated it and found our systems study indicated the other systems had more limitations," Devlin continued. "This was a type of system that had more flexibility."

The association needed a greater amount of operational flexihility because of the nature of its lending program. "We needed greater operational latitude," and also wanted to create a more comprehensive system, he added.

Before the minicomputer was installed, the institution was processing the loans manually. Now, the system processes all the loan documents necessary to meet all requirements and handles the loan accounting and tracking, Devlin reported.

Loan Processing

"On a regular loan, there are about 25 documents to be prepared. Throughout these loans and the various documents there is a good deal of repetition of information and computation," Devlin said.

The system can handle about 72 types of documents, he said.

The equipment operator receives a folder with some basic information such as the credit approval. Using questions flashed on the system's associate CRT, the operator inputs the required information and the system calls up the documents that are needed for each particular type of loan.

"They just insert the documents one at a time and the system types them out," Devlin noted.

Fidelity has purchased the system and is leasing the software, Devlin said. Maintenance is supplied by ECO.

"The system is cost-justified and has proven its value to the association," he added.

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Simulation Lab Trys All — Rockets to Atomic Plants

SAN DIEGO, Calif. — What do a Centaur rocket lifting a scientific payload, a Tomahawk Cruise Missile streaking down range and an atomic power plant generating electricity have in common?

Before the switch was ever thrown, each was simulated in its mission, by a dedicated system in the Hybrid Simulation Laboratory of the General Dynamics Western Data Systems Center (WDSC) located at the Convair Division facility here.

Simulation has been defined as the development and use of models to produce chronologically a history of the system being tested. Generally, most people link simulation with aircraft and they are mostly right. Two of the three general categories of simulation are aircraft-oriented: specific aircraft simulation, which is modeled after a particular aircraft, and general-purpose aircraft simulation, which can be modeled after a host of aircraft.

But the third category — a general-purpose simulation facility — is used to simulate everything from electronic equipment to flight hardware.

The computer has played a major role in simulation. Historically, the analog computer has been the prime system used because of its speed, ability to be tied into actual hardware and the "building block" approach it permits in simulating the model.

But in the past decade, digital computers have been used increasingly because of their greater precision, efficiency, computational capability, immense storage and the fact that they are equation-oriented.

Best of Both Worlds

"A hybrid computing system combines the best of both worlds — an analog computer with a digital computer," WDSC data systems specialist Harold Wasilk said.

System specialist at Western Data System Center runs a simulation.

The simulation facility here was configured and sized to support projects in which General Dynamics' Convair is involved, according to Wasilk. It includes three fully expanded Comcor C15000 analog computers, a Harris Corp. Slash 4 virtual memory system with 240K bytes of core memory, ASR 733 teletypewriter, 600 card/min reader, 600 line/min printer, 10.8 M-byte disk, two CRT terminals, two 75 in./sec tape drives, intracommunication system provided as the analog-digital interface, 64 channels of analog-to-digital conversion and 64 channels of multiplying digital-to-analog converters. In addition, it is equipped with a visual system for pilot training.

The WDSC hybrid simulation facility is operated as an open shop, allowing outside as well as inside users access to the hybrid system. In-house demands on the system are for ongoing simulation of the flight characteristics and aerodynamics of the Tomahawk Cruise Missile and hardware simulation of the Centaur guidance system. Other in-house requirements include general engineering projects.

Perhaps the most interesting demand on the system from an outside user is the simulation studies on nuclear power plants being carried out by General Atomic Corp. of San Diego.

Fort St. Vrain is a nuclear power plant in Colorado which is being simulated by General Atomic. Certain phases of this plant's start-up are being simulated on a mammoth model at WDSC.

Mathematical Model

"What we're doing is separating a mathematical model of the plant into two pieces," Tony Spurgin, section leader in charge of control systems at General Atomic, said. "The dynamic equations such as the fluid system, gas circulation, high pressure turbine and control system are modeled on the analog computer and the steam generator, reheater and primary thermal model are modeled on the digital."

Then, using the digital system, they speed up the plant operation 10 times faster than real time by updating the model with a series of 10 integration steps per second and function updates (steam tables, gas flow tables, pumping, etc.) at the rate of 50 per second.

"This greatly increases the number of runs we get per day and reduces the general fatigue of the people monitoring this operation," Spurgin said.

General Atomic normally goes through many stages in its simulation of an atomic power plant. After an initial study, it scopes out the kind of control system it wants, develops the model equation and then simulates it. When the design has been solidified, and prior to the ordering of components, the firm does a more complex simulation.

And then, prior to start-up, General Atomic does an extremely complex simulation with as much data as possible. As data comes back from the plant, necesssary modifications are made to make the model a more faithful representation.

Floppy From Bedford Fits Dual Cassettes

BEDFORD, Mass. — The Model 7500 Dynaterm flexible disk from Bedford Computer Systems, Inc. is compatible with current industry-standard, dual-cassette units, according to the vendor.

The unit features asynchronous serial interface communications with terminal and line ports and can accommodate variable length records, Bedford said. All but two codes of the 128-character Ascii set may be stored, the firm noted.

Control codes initiate sequential read operations and searching on either diskette; reverse reading/writing and character editing are possible on Drive 2, the firm stated.

Each diskette has a storage capacity of 315,000 characters.

A single drive costs $2,900 and a dual drive costs $3,550. Bedford is at 3 Preston Court, Bedford, Mass. 01730.

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CONTROL DATA CORPORATION

Turnkey Monitoring System

'Autrax' Keeps Round-the-Clock Vigil of Phone Lines

SANTA MONICA, Calif. — A computerized turnkey monitoring system is enabling traffic engineers with General Telephone Company of California to more efficiently administer and maintain trunking and switching plant facilities.

The Automatic Traffic Recording and Analysis Complex (Autrax) system, collects usage data from individual circuits and processes the data to show engineers the amount of traffic on each circuit and the condition of each circuit.

The system in operation at General Telephone consists of 10 Telesciences-manufactured TE 500 terminals connected to 100,000 circuits. The collected data is processed by a Hewlett-Packard 2100 minicomputer which produces reports on a periodic basis and which can also produce real-time "quick look" reports at up to 63 remote locations.

The system was programmed and installed by Telesciences Computer Systems (TCS), a Telesciences subsidiary.

Carl Lanterman, traffic facilities engineer for General Telephone, said the system is being used to determine whether existing facilities require expansion or reduction, to determine how the network is functioning and to locate defective equipment.

Autrax maintains a 24-hour vigil over the circuits, logging the data on magnetic tape for later analysis.

By determining whether a particular network is underutilized or inadequate to meet traffic demands, the phone company engineers can avoid waste of resources or customer dissatisfaction due to difficulty in completing calls, according to Lanterman.

If, for example, engineers find that a lineboard with 20 switches which can accommodate 200 customers is being used by only 125 customers, they may determine that only 15 switches are needed, and the remaining equipment can be installed elsewhere, he explained.

Monitoring Methods

Traditional methods of monitoring such equipment vary greatly, but a common method involves the use of mechanical registers or digital counters to gather the network data. The devices are monitored manually or by a row of cameras mounted in front of the registers.

According to TCS president Joe Murgio, such methods require management to wait a minimum of six to eight weeks for data development which includes film processing, editing and keypunching and transcribing operations.

Other methods of monitoring phone equipment have also been limited in the preciseness of the information they can provide, Murgio said, because they measure groups of circuits instead of individual circuits. It is generally too costly to measure individual circuits mechanically.

"Group measurement is often inadequate," Murgio said. "In a group of trunks from New York to Los Angeles, there might be 30 to 40 trunks, and if you are just measuring the traffic on a group basis, it is difficult to locate an individual defective circuit or it might go unnoticed."

The mini-based Autrax system measures the peg count (attempts to use a circuit) and usage (the amount of time a circuit is in use) of each circuit in a group. From this, the system calculates the holding time (the amount of time a circuit is in use per call) for each circuit. By comparing the data from each circuit with that of the norm, phone company engineers can locate a malfunctioning circuit.

And unlike other monitoring systems, Autrax users can know what is happening on a circuit by means of an exception "quick look" report.

Besides manpower savings resulting from the phone company's ability to quickly pinpoint trouble spots, Autrax enables the company to make repairs before customer service is seriously affected, Lanterman said.

Identifies 'Killer Trunks'

An Autrax user is able to identify "killer trunks" (trunks with extremely short holding times and high peg counts), trunks which are permanently busy, unable to be accessed or which are not otherwise observed because of wiring errors. The monitoring system can also be used to locate inoperative pay phones.

According to Lanterman, the company expects to have over 200,000 circuits monitored with Autrax by next year. The company is hooking into the system those circuits that are "traffic sensitive," that is, subject to a particularly high rate of malfunction because of heavy usage, the complexity of the network or other factors.

Components of an Autrax system include the portable TE 300 or TE 500 terminals, an HP 2100 or 21MX minicomputer with 24K to 32K of memory, an HP disk with 5M to 15M bytes, a teletypewriter console, a magnetic tape unit and a high-speed printer.

The system communicates with its terminals via multiparty private lines, or the Distance Direct Dial network, polling the terminals independently at intervals ranging from 15 minutes to 24 hours.

Irrigation System Set For '77 U.S. Debut

TEL AVIV, Israel — A minicomputer-controlled irrigation system developed in Israel by Motorola/Israel Ltd. will be available in the U.S. this year, according to a spokesman.

The system can be used to regulate electric supply and sewage connection as well as irrigation and includes either a Hewlett-Packard Co. 2105 mini or a Motorola MC 6800 micro, the company noted.

The system is divided into the master control station — which includes the CPU, a supervisory console, a map of the irrigation network and a teletypewriter — and the field units, which are standard process control-type sensors, the firm said.

The system was originally designed for remote Israeli border settlements whose fields had been mined in wartime. The system allowed farmers to irrigate crops without walking in the field, the spokesman explained.

Information is available from Motorola at 16 Krenenekki St., Tel Aviv, Israel.

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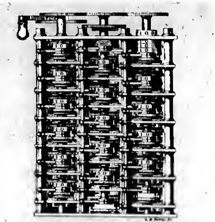
Distributed Processing Today. In 1977, hundreds of distributed processing networks are serving American corporations in such industries as retailing, transportation, manufacturing, wholesale distribution, banking, insurance, stockbrokerage and medical services. In implementing distributed processing, these companies have learned that optimal performance requires remote display/processing systems flexible enough to be precisely scaled to the needs of each individual site.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Micro Advances Enhance Traffic Control

By Harvey J. Goldenberg
Special to Computerworld

NEW YORK — Recent advances in large-scale integration have made it possible to place a digital computer central processing unit on a single chip. This advancement has led the New York State and California Departments of Transportation into the development of a microcomputer controller for traffic signals.

A few silicon gate N-channel MOS devices constitute most of the logic circuits within the microcomputer. Large scale integration, in conjunction with the microprocessor, reduces the number of interconnections to a point where the mean time between failure is expected to be 25,000 hours or three years of operation. The component count is so low that only one-ninth as many components are needed as before.

The new microcomputer traffic signal control equipment is capable of receiving data from up to 44 sensors as to vehicle presence, vehicle speed, pedestrian presence and preemption (both fire and railroad), while simultaneously communicating to the outside world via standard telephone lines to exchange or update data or timing or to operate in a coordinated system with other microcomputers.

The microcomputer will use all received data to give green light priority to the direction from which most traffic is approaching at any particular time, while performing 250,000 calculations per second.

This electronic traffic system will continually search for the optimum green time that will provide the least delay for the motoring public. The microcomputer system contains a microprocessor unit (MPU), an 8-bit Motorola 6800-type microprocessor; up to eight 2708 1K by 8-bit programmable read-only memories (Prom) and up to 1K by 8-bit nonvolatile random access memories (RAM), which together store the computer program and data necessary to operate the MPU; 10 output ports (80-line output) and eight input ports (64-line input), both of which provide a flexible input/output interface circuitry to the traffic sensors and traffic lights; a communications interface to both a data terminal and a modem for telephone interconnect; and a front panel with displays and keyboard for user interface.

Smarter than conventional traffic signal equipment, the microprocessor can sense minor equipment malfunctions, such as input detection failure or communications failure, and reduce or eliminate their effect on traffic movement.

In case of malfunction, the equipment is capable of isolating parts which need to be replaced by using the MPU and a diagnostics Prom card (replaces operating Prom card when used) as a built-in semiautomatic self-tester.

The microcomputer traffic signal controller uses a classic self-test approach incorporating two Proms on the diagnostics board with a test program stored within them. They take the place of the standard system Proms and supply instructions for testing performed by the MPU. The results are seen on go/no-go lamps.

The test itself consists of testing all RAM locations with known bit patterns and exercising the microprocessor through its complete instruction set which is designed to test arithmetic capability, all registers and register to register data transfer.

Goldenberg is with the traffic control and engineering bureau, N.Y. State Department of Transportation, Traffic and Safety Division.

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CI Notes

Tally Acquires Vienna Firm Formerly Arm of Potter

KENT, Wash. — Tally Corp. has acquired Potter Instrument's Austrian subsidiary from private investors who previously purchased it from Potter.

Acquisition of the Vienna-based firm provides Tally with manufacturing capability for its anticipated growth in Europe, where Tally currently conducts about half of its business.

The Austrian company was previously granted certain exclusive and nonexclusive product rights by its former U.S. parent with respect to the manufacture and sale of peripheral equipment produced in Vienna.

For accounting purposes, the acquisition will be treated as a purchase with a price of about $1.24 million paid in cash and promissory notes over the next two years.

CSC Reorganizes Infonet

EL SEGUNDO, Calif. — Computer Sciences Corp. has reorganized its Information Network (Infonet) division, delegating headquarters responsibility out into the field.

Five division vice-presidents were appointed to handle the larger management structure.

"Infonet has grown to a size where we can manage more responsively and efficiently by decentralizing many of our headquarters activities," John W. Luke, Infonet president, said. Infonet revenues totaled $55 million in the latest four quarters.

The new operations include engineering and communications, software development, operations, business and industry marketing and government programs.

Supershorts

Stromberg Datagraphix, Inc. has changed its name to Datagraphix, Inc.

— — —

Dial Computer System Corp. has been formed as the DP and telecommunications division of Dial Financial Corp. The division was previously known as Project Swift.

— — —

TRW Communications Systems and Services has established a Technology Research Center to explore electronic and software technologies for future systems.

If 'Separate Charges' Ended

Government Faces Dip in DP Contractors

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — The U.S. government may face a deterioration in the number of DP firms willing to sign federal contracts if it follows through on a proposal to eliminate all termination charges.

It's not that these companies don't want large orders from the federal agencies. It's just that most vendors currently doing DP business with the agencies through the General Services Administration (GSA) can't continue unless the government finds some way of renewing its previous guarantees that systems will stay installed until the vendors recoup their initial investments.

Industry doubts that these government guarantees will be retained have grown out of two recent decisions by the General Accounting Office (GAO).

On Dec. 9, the GAO issued parallel decisions on two protests, both involving Honeywell Information Systems, Inc. (HIS). The cases dealt in varying degrees with the "separate charges" a vendor may charge the government if an agency returns the equipment before the end of the system's life.

In one case, Burroughs Corp. protested the GSA's award of a contract to HIS to provide a system with a proposed 65-month life to the Mine Enforcement and Safety Administration (Mesa) in the Department of the Interior. The contract is being funded with fiscal year funds, making the government's extension of the contract beyond the first 12 months a part of its "option rights" under GSA's Federal Property Management Regulations, the GAO explained in its decision.

HIS was the low bidder for this government business with a price of $1,884,874; Burroughs offered to provide the system for $1,977,816.

HIS could afford to offer a lower price, in part, because the severity of its separate charges would make the government reluctant to turn back the equipment before the 65 months were up, according to an industry consultant.

Charges Found Unreasonable

In the second case, HIS was the protester, arguing against the award of a fixed-price contract to any other vendor bidding to provide seven systems and one optional one to serve as DP service centers for the Navy, the GAO said.

These eight centers will replace the 35 obsolete systems that now operate at locations throughout the U.S. Once again, the contract is for fiscal year funds and would ultimately be for a period of 96 months if GSA exercises all of its option rights.

In this case, the GSA evaluated certain separate charges continued in HIS' final proposal and found them unreasonable because they exceeded the value of the basic contract, the GAO stated.

In reviewing HIS' protest, the GAO also found that where separate charges were calculated as a percentage of future years' rentals on the discontinued equipment, their payment would violate certain legal restrictions.

These restrictions relate to funds made available on a fiscal-year basis for the purchase or lease of DP equipment. In other words, the GAO reaffirmed that it is illegal to use this year's money to pay for next year's needs.

HIS might make "reasonable" charges against the government, however, for costs incurred while performing work that the government then decided to terminate. Even then, these separate charges must be considered along with the payments already made to the firm, the GAO said.

Wants Clause Rewritten

The GAO took an independent look at the separate charges HIS included in its bid for Mesa's business and arrived at the same conclusions.

The agency also determined, however, that the GSA must rewrite the clause in the regulations that has led vendors to believe they can use penalties as insurance against government terminations.

(Continued on Page 70)

Small Business System Market Seen Hitting $2.2 Billion in '80

By Toni Wiseman
Of the CW Staff

SAN JOSE, Calif. — The small business computer market continues to be one of the fastest growing in the industry, both at the entry level for small businesses buying their first computer and independently for large businesses decentralizing their DP operations.

The small business computer market includes accounting computers, mini-based systems and small DP computers.

Domestic shipments in this market rose from $794 million in 1972 to $1.4 billion in 1975 and will continue to grow to $2.2 billion by 1980, according to a report by Creative Strategies, Inc. (CSI).

Broken down by category, U.S. shipments for 1975 totaled 38,000 units, of which 22,000 were accounting machines, 8,500 were mini-based systems and 7,500 were small DP systems, the report said.

By 1978, accounting computer shipments will grow to 26,000 units then decline to 22,000 in 1980, the report forecast. Mini-based systems shipments, however, will reach 30,000 units in 1978 and then 46,000 by 1980, while small DP computer shipments will decline to 7,000 units in 1978 and drop still further to only 5,000 units in 1980.

Of the major mainframers, IBM, Burroughs and NCR account for the major shares of this market, the report stated. "IBM has continued to dominate the small DP segment of the market with its popular System 3 family.

"Burroughs is the clear leader in the accounting computer segment with its numerous models of the 'L' series. NCR has struggled to keep up with these two giants and has experienced improved results in recent years," it continued.

The minicomputer-based segment of the small business computer market is the area of greatest interest and greatest competition, with some 8,500 systems shipped in 1975, CSI said.

IBM's announcement of the System 32 was followed by "spectacular sales" in 1975, giving IBM a major share of this segment, it added.

"Nevertheless, it is in this segment where the great number of new entrants are attempting to compete, and their combined efforts are aimed squarely at IBM as well as at each other," the report stated.

Major competitors in the minicomputer-based area include IBM, Burroughs, NCR, Digital Equipment and Hewlett-Packard as well as smaller firms such as Basic/Four, Microdta, Nixdorf and Wang.

Distributed processing "has begun to spill over into the small business computer in-

(Continued on Page 70)

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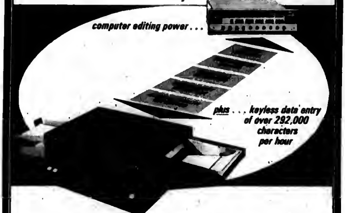
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Small Business Mart Growing

(Continued from Page 69)

dustry in a major way," the report stated.

"The introduction of communications capability into small business computers has permitted their sale as dual-purpose systems, capable of performing complete stand-alone operation as well as data entry for larger systems.

"This growing demand by large companies will eventually provide half of annual sales by 1980. And the inclusion of both large and small businesses in the marketplace indicates a potential market of over 500,000 units," it stated.

CSI estimated about 80% of the installed small business computer base is in small businesses, those with 300 or fewer employees and less than $20 million in annual sales.

Shipments in 1975, however, were distributed 65% to small business stand-alone, 20% to large company stand-alone and data entry and 15% to large company stand-alone, the report stated.

The international flavor of the small business market is also noteworthy, both in terms of imports and exports, CSI said.

Olivetti, Philips and Nixdorf have all been active in the accounting computer segment of the market. Nixdorf is currently marketing its 8870 mini-based system in the U.S. and International Computers (USA) Ltd. is selling its 2903 small DP computers here, CSI said.

In addition, Nippon Electric Corp. (NEC) is expected to enter the U.S. market this year with a small business computer it has already developed for the Japanese market; Mitsubishi is already operating in the U.S. as Melco, Inc.

"The major weakness of the foreign competitor has been distribution and many have placed top priority on acquiring or building an organization of sales and marketing people.

"Nixdorf, which has chosen to establish its own sales offices rather than sell through independent dealers, has doubled its coverage recently from 20 offices to 40 offices nationwide," the report said.

Although the domestic installed base of small business computer systems at the end of 1976 was expected to be about 180,000, total worldwide installed base was expected to reach 300,000.

CSI estimated nearly 50,000 small business computers were shipped by both U.S. and foreign manufacturers in non-U.S. markets during 1975.

And, while U.S. companies continue to dominate world markets, domestic manufacturers are tough competitors on their home ground. Nixdorf, for instance, has a major market share in West Germany and other European markets with some 30,000 small business computers installed, while International Computers Ltd. has a healthy market share in Great Britain and a certain clout in Europe, Africa and the Middle East, the market research firm noted.

"Many smaller U.S. manufacturers have recognized the potential of the foreign markets and have been increasing their efforts to penetrate them," CSI noted.

"Unlike IBM, Burroughs and others who maintain several production facilities abroad, companies like Basic/Four, Microdata or Wang produce their small business computers in the U.S. and then export them," the report said.

Many of these smaller firms use distributors or dealerships in foreign markets because the cost of selling and servicing small business computers there is even greater than in the U.S., CSI said, noting that is the only way such companies can compete.

"Conversely, this strategy also has the increased risk of loss of control over quality of installation, training and servicing. "But the problems are no different than for any other industry trying to cope with foreign markets, and the returns can be great," the report stated.

Government Faces Dip in Bids

(Continued from Page 69)

This "fixed-price options" clause states that the "separate charges" or penalties for which the government may be assessed, should it fail to exercise its option rights and not extend the contract for the full life of the system, can be included in vendor proposals to do agency work.

The GAO called this clause "inappropriate and misleading" when contracts are funded with fiscal year monies — as so many DP awards are.

As presently worded, the clause fails to inform vendors that some of their charges are illegal, the GAO said. In addition, the regulations do not explain how the GSA will evaluate these charges in the context of the bid as a whole.

Finally, the clause does not warn the firms their penalties may unreasonably restrict the government's ability to substitute equipment, the GAO noted.

Separate charges cannot logically be added to the base and option prices to determine which vendor has the lowest offer anyway, because both prices and separate charges will not be paid — they are alternatives, the GAO told the GSA.

Temporary Solution

So far, the GSA has devised an "interim" solution to HIS' protest over the work to be done for the Navy. The "fixed-price options" clause has been amended to stipulate the government won't accept any termination charges and asks that none be submitted by the vendors, a GSA spokeswoman said.

The Burroughs protest over the Mesa contact will take more time to resolve, she added, noting that the ramifications of permanently altering the clause "could be just wild."

Among those "wild" ramifications is a drastic reduction in the offers the government will receive if it eliminates separate charges altogether, according to Terry Miller, president of Government Sales Consultants, Inc.

Most of the firms doing business with the government won't be able to continue to bid on the government's requests for proposals (RFP), Miller said.

"Assume there are 500 firms selling to the government right now. Only five or six would be able to continue to do so because they can afford to self-finance expensive, long-term lease arrangements," he stated.

About 20 to 25 DP firms have contacted Miller and told him they either won't be able to bid for government work at all or will have to raise their prices by 10% to 15%.

Ominous Trend

The GAO decisions suggest reasonable charges would be acceptable, Miller noted, but he sees an ominous trend developing among those agencies which have already revised their existing RFPs to eliminate termination charges altogether.

The Automated Data Processing (ADP) Fund established by the Brooks Bill 12 years ago could be used by the GSA to ease this situation if it contained a billion bucks, Miller suggested.

Designed to provide agencies with a means of purchasing DP equipment outright where that option provides the government with the best deal, the fund has only been used once in a competitive buy situation, he believes.

The whole problem could be solved if the agencies had the fund rather than fiscal year appropriations to work with, Miller added.

He predicted that if the GSA decides to abolish separate charges, the government will feel the effect most where terminals, plug-to-plug equipment and used DP buys are concerned. The agencies will receive far fewer bids and the price will be higher, he said.

F&S Predicts 'Explosive Growth' in Sales of DBMS

By Toni Wiseman
Of the CW Staff

NEW YORK — While data base management systems (DBMS) have been commercially available for more than seven years, only about one in 10 computer installations currently has a system.

But "DBMS use has crossed the 'critical mass threshold' that will trigger an explosive growth," according to a report by Frost & Sullivan, Inc. (F&S), a market research firm here.

The U.S. DP industry achieved revenues of about $33 billion in 1975. By 1980, revenues will have grown to almost $63 billion, a growth rate of approximately 18% annually. Some 12% of those amounts have been, and will continue to be, collected by remote computing services (RCS) firms.

DBMS already accounts for more than 20% of the $1 billion in revenues realized by RCS firms and about $80 million in revenues for independent software houses, the report said.

65% of Revenues in 1980

By 1980, DBMS will account for 65% of all remote computing revenues, or about $1.1 billion. For software firms, DBMS will reach $300 million, it predicted.

F&S called DBMS "the single most significant software product to come along since the advent of computer operating systems." DBMS, the report noted, should not be confused with information storage and retrieval (ISR) systems and file management systems (FMS).

"All three include blocks of code that may be a storage medium to get it back out. But the similarity ends at this juncture. DBMS is an order of magnitude more generalized," it said.

ISR systems allow easy storage and retrieval of textual information, but the only processing performed upon the retrieved "data" is display or printing.

FMS function as subroutines or subprocedures to relieve programmers of coding chores associated with data manipulations, but no data integration takes place.

Three Basic Structures

There are three fundamental structures employed in DBMS: hierarchical, network and relational. Among the available DBMS products, all three structures (very nearly always with detail variations) are represented by one or more packages, F&S noted.

"In point of fact, several DBMS products incorporate more than one basic structure, and virtually none exhibit an unmodified basic structure," the report said.

"The applicability of DBMS is very nearly universal in business data processing," it pointed out. "Thus, the division of the market for the product into neat industry segments is a self-defeating exercise. Very nearly as pointless is any attempt to identify a type of data that cannot be accommodated."

Personnel, order processing and accounting DBMS applications are most common since each of these is and can be a corporate, as opposed to a divisional, responsibility.

Prerequisites to Use

The fact that DBMS is very demanding of cash and commitment tends to favor applications supportable at the corporate level, where more cash can usually be made available and broad company commitment may be dictated, the report suggested.

Cash, commitment and a degree of sophistication in computer use constitute the necessary prerequisites to DBMS use.

"Ancillary considerations may modify but never negate the relative weight of any one factor. For instance, various pricing schemes and deals may allow a cash-short prospect to employ one of the products by easing that burden," the report said.

RCS firms have been more successful than software sources in this marketing ploy because the former can offer the products on the basis of charges tailored to use and use can in turn be tailored to requirements.

"It is this that has made a big-computer, big-company product accessible to smaller companies that may not own any computer at all," F&S said.

U.S. Prime Market

The U.S. is the prime DBMS market and will remain so for the foreseeable future, the report said, since it exhibits the highest level of computer use sophistication and discretionary business income in the world. It also contains more big companies per capita than any other nation.

"Thus, it exhibits the highest levels of two of the three requisite characteristics. Only commitment is left to consider. Traditional American competitiveness coupled with concerted marketing effort by the several product sources will certainly take care of that," F&S commented.

Canada boasts the second most sophisticated computer user population in the world. A lower incidence of large companies is "neatly balanced" by the nearly universal acceptance of the "shared processing" concept; less bright prospects for in-house DBMS package sales are therefore offset by higher potential RCS-vended sales, the report said.

"Despite the fact that Europe is the home of Software AG, developer of Adabas, Europe lags North America in all prerequisites for extensive DBMS employment. It is probable that use there will never approach that in the 'New World' and will grow much more slowly," F&S stated.

Commerce Picks NCC For Foreign Buyers

DALLAS — The National Computer Conference (NCC '77) scheduled for June 13-16 at the Convention Center here has been selected by the U.S. Department of Commerce for attendance by foreign buyers.

The Commerce Department's Foreign Buyer Program is one of the agency's efforts to promote interest in American goods, services and technology.

Commerce, the American Federation of Information Processing Societies (Afips) and the Dallas-based conference steering committee are working closely together to establish direct communications between NCC exhibitors and prospective foreign buyers. Their objective is to assist both parties in making advance arrangements for establishing contact during the conference.

An international business center, staffed by Commerce Department representatives, will be provided as a place where visitors and exhibitors can meet.

Additional information is available from Afips at 210 Summit Ave., Montvale, N.J. 07645.

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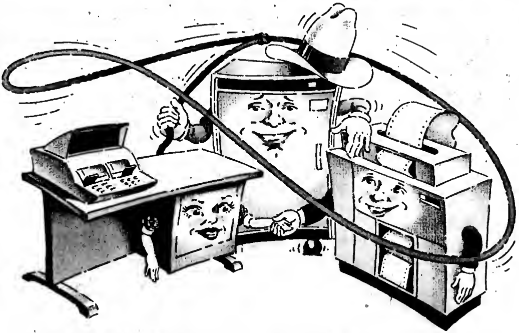

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Regrouping Its Forces

DEC Presenting New Image to Large Systems Users

By Toni Wiseman
Of the CW Staff

MARLBOROUGH, Mass. — Digital Equipment Corp. is regrouping its forces and presenting a new, more uniform image to its large systems users.

It is, paradoxically, also dividing its forces into separate units, one of which will target Dec's ever growing business market.

Since 1964, the large computer group (LCG) has been selling its Decsystem 10 and Decsystem 20 into a number of different markets, almost all the same markets as the firm's minis. But until now, all product development, marketing, and engineering was lumped under LCG.

Recent Realignment

Dec has recently realigned the LCG organization into a market-oriented structure including a commercial systems group and an industrial products group, which are formally becoming product lines each with its own marketing manager, product manager and budget, according to Mark Roberts, marketing manager for the commercial systems group.

This leaves the education, government and scientific groups still within LCG, but they will probably break out at the beginning of the fiscal year, he said.

All groups, including commercial and industrial, will continue to report to John Lang, vice-president of LCG.

The growth of the large systems market and the size of the LCG organizations prompted the shift, Roberts said, to allow focusing on those areas where the firm is doing well.

Decsystem 10s, for instance, appeal to very sophisticated users which have traditionally been in three markets: science, education and government, he noted.

One of 'Hottest' Marts

"Now that we have a whole family of systems with the line of 10s, the 20/40 and 20/50, we are appealing and selling to a much broader range of users," Roberts stated, noting the business sector is now one of their "hottest" markets.

"People are buying the Decsystem 20 because of its price/performance and because of its functionality or ease of use, we find. These are some opposite reasons to why users bought system 10s," he added.

In addition to getting more emphasis on specific markets, the realignment allows the LCG to coordinate its efforts more effectively with the mini product lines serving the same markets.

This allows DEC as a company to present a stronger, more uniform image to the business, educational or other user: one company sales strategy, one image, one message to the customer, Roberts explained.

Gap Closing

This is particularly important in light of that fact that the gap between the mini products and the large systems is closing, providing for user growth from small to large machines, Roberts said.

The gap between a large 11 and the Decsystem 20, for instance, is easily bridged today as the company works to make its machines fully compatible up and down the whole range.

"The mini group has Basic +2 for the PDP/11 and the 20/50 offers compatible Basic +2. This means the user can grow with little or no conversion problems," he explained.

In addition, Decnet provides real compatibility between minis and the large host in a distributed processing area, he said.

In the commercial area, Dec plans to emphasize the distribution market, such [illegible] warehousing applications, the telephone industry, smaller interactive service companies and commercial distributed processing networks, Roberts said.

In addition, it will sell equipment or interactive production applications for flat in-house time-sharing, he stated.

Dec plans to develop capabilities within its systems which make putting applications up "trivial," Roberts said, adding Dec will make an effort to develop packages which "make sense and for which there is a need."

"Payroll and accounts receivable are readily available from third parties; users don't need that kind of package from a vendor. But where the application is critical to an industry, Dec will get involved in development efforts," he said.

Dec's realignment means a substantial increase in the number of its marketing, development, applications planning and sales people, Roberts said. The maintenance service, however, will be aligned with the product rather than the group as a more efficient mode of operation, he noted.

Dec's growth in the large systems market has been in excess of 50% a year, Roberts stated, adding he feels LCG will be able to maintain much the same growth rate with its new marketing philosophy.

Signetics Enlarges MOS Micro Group

SUNNYVALE, Calif. — Signetics has expanded its MOS microprocessor group to focus on specific industries and applications.

The organization along functional lines replaces a product line organization where there were separate managers for the 2650 microprocessor and the Twin Prototyping and Development System.

The expanded organization is a step toward a new emphasis for MOS microprocessor marketing, according to Norm Rothstein, marketing manager.

Purpose of Revamp

"The thrust of the organization will be to provide microprocessors and chip sets along with software that offer the best possible solution for a specific application or industry," he said.

Rothstein said Signetics will introduce a new MOS microprocessor in about six months "that will be more applicable to current and planned uses for microcomputers than any competitive unit," as well as several new interface products for the 2650.

Sheehan Dies

WALTHAM, Mass. — Lee E. Sheehan, vice-president and general manager of Honeywell's Information Systems (HIS) Group, died of a heart attack last week. Sheehan was 49.

He was responsible for the company's computer marketing, planning, design, engineering, manufacturing and field engineering activities in the U.S.

Sheehan joined Honeywell in 1949. In 1970, he joined HIS' North American Operations as vice-president of the Computer Systems Division.

In 1974, he became vice-president of the North American Systems Operations with responsibility for all computer systems engineering and manufacturing.

Sheehan became vice-president and general manager of the firm's North American Operations in 1975 and was appointed to his latest position in December 1976.

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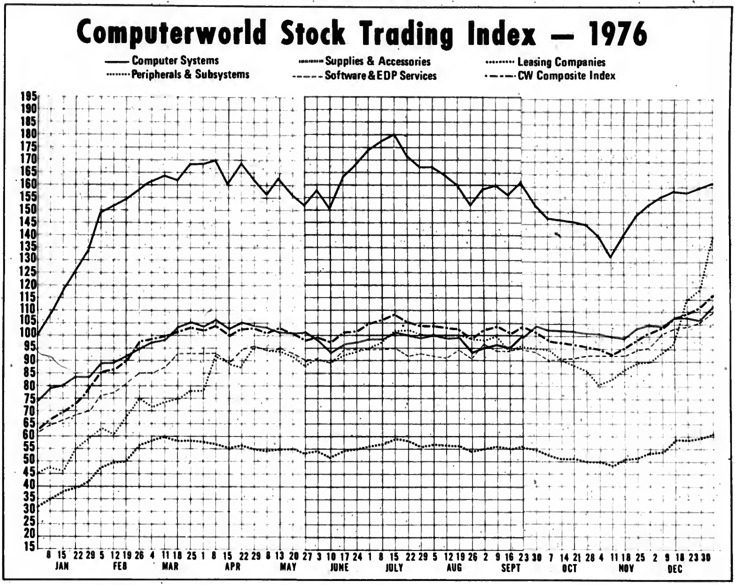

DP Trading: It Was a Very Good Year

By Molly Upton
Of the CW Staff

Well, 1976 certainly should have warmed the cockles of DP investors' hearts, especially those who have been hanging on since the relatively flat, lackluster year of 1974.

The 1976 *Computerworld* stock trading index looks somewhat like it did in 1975, but on a higher scale. Systems stocks reached their zeniths in June and July in both years.

Once 1976 began, all categories of stocks took off for the wild blue yonder, never dipping as low as their highest 1975 points after the third week in February.

Although systems stocks consistently ranked higher on the CW stock trading index than the other categories, some of the aura of the boom rubbed off on the other categories. It was a good year for all sections, and most doubled their standings between Jan. 1 and Dec. 31.

CW's composite stock index nearly repeated its 1975 feat of doubling, and jumped from 60 to about 115.

The smallest point spread in a sector was 30 points, but that represented a doubling for the peripherals sector, which ended at 60.

Less conspicuous than the systems index, which began at 100 and ended at 165 with a high of 180, was the leasing sector. Lessors' stocks posted a 95-point gain and also doubled, ending at 140.

Software and DP services nearly doubled, from 62 to 110. Supplies and accessories posted a 35-point gain but, like systems, didn't come close to doubling for the year.

The distance between the high and low flyers increased. Beginning with a 70-point spread between the systems and peripherals sectors at the outset of 1976, the spread reached 100 points at year end.

Crystal ball projection, based on a skeptical nature and a hunch, sees the systems stocks dropping to a fairly level pattern somewhere between the 140 and 85 range. However, the market at large and national economic policies concerning inflation are unknown influences.

What caused the 30-point boom in systems stocks that occurred five weeks prior to July 15? And why the 10-point drop in the next two weeks and the slide that continued until November?

Could it have been that the market was feeling pretty heady and systems were riding high, buoyed both by a broad-based rise in prices as well as some hefty upward urging by IBM, which twice posted gains of over nine points?

And could the bloom have come off the rose a bit when others figured out the late June announcement of the 370/138 and 370/148 unveiled a marked improvement in IBM price/performance ratios?

The rise was broad-based. For the week ended June 16, only two of CW's systems stocks were stagnant and only one registered a minor decline; all others gained.

In the week ended June 23, both Digital Equipment Corp. and IBM posted gains of more than nine points, and in the rest of the field gainers outnumbered losers.

In the next week, only three firms showed stock declines.

Perhaps it was coincidental; but when IBM stock ceased to rise the week of July 14, the systems index began a slump that essentially lasted until it hit 132, its low for the second half.

Financial News

Those doomsayers who think the systems index belongs somewhere in the low 100 range should take note of the hearty recovery the sector exhibited from the October nosedive of nearly 10 points to the 132 points it posted Nov. 11.

The indomitable group climbed sharply in the following five weeks, perhaps after investors recovered from the shock that the Democrats had taken the White House.

The systems sector finished the year by completely recovering from the drop and regaining the 160 mark from whence it had most recently fallen Sept. 23.

Granted, that was down from the 180 on July 15, but still a pretty hefty improvement for the year when it began at 100.

Supplies and accessories, software, leasing companies and the CW composite sectors spent most of the year gamboling through the airy pastures in the range between 90 and 110.

These groups were quite closely intertwined on the index compared with 1975 when each staked out its own space on the chart, normally about 10 points away from its nearest neighbor.

Sperry Posts Nine-Month Gains

NEW YORK — Sperry Rand Corp. realized a 4.8% gain in earnings for the third quarter along with a 3.9% increase in revenues.

Earnings rose to $36.7 million or 96 cents a share compared with $35 million or 98 cents a share in the year-ago quarter.

Revenues for the quarter rose to $808.7 million from $778.7 million in last year's period.

For the nine months, earnings rose 4.7% to $109 million or $2.86 a share compared with $104.1 million or $2.92 a share in the comparable 1975 period.

Revenues gained 2.8%, rising slightly, to $2.37 billion from $2.30 billion in the 1975 nine months.

"Business conditions around the world during the December quarter were mixed, resulting in only modest gains for the corporation," according to J. Paul Lyet, chairman and chief executive officer.

"However, backlog for the corporation at Dec. 31, 1976 was a record $2.1 billion, up 3.5% from Dec. 31, 1975," he said, noting the company had increases in both revenues and income from Univac as well as other divisions.

These gains were offset by the effects of a seven-week strike at the Sperry Division and weakness in the Sperry Remington consumer products business.

All-Time High

NCR Fourth-Quarter Net Up 125%

DAYTON, Ohio — NCR Corp.'s earnings in the fourth quarter of 1976 was $38.9 million, a gain of 125% over the $17.3 million reported in the comparable period of 1975 and an all-time quarterly high, according to the firm.

Per-share earnings rose 107% to $1.41 compared with 68 cents in the year-ago quarter.

Worldwide revenues for the quarter, which totaled $715.8 million, benefited from greater than anticipated shipments both domestically and overseas.

The revenue increase represented a 10% gain over the $648.6 million reported in 1975's final period.

Financial News

The fourth-quarter results brought earnings for the year to a record $95.6 million, a 32% improvement over 1975 earnings of $72.5 million.

Per-share earnings in 1976 were up 24% to $3.60 compared with $2.90 in 1975.

Revenues for the year reached a new high of $2.3 billion, an increase of 7% over 1975 revenues of $2.1 billion.

William S. Anderson, NCR chairman, said the earnings gain for the year as a whole stemmed primarily from domestic operations and reflected heavier equipment deliveries, greater field engineering productivity, the impact of various cost-control measures and a 7% reduction in interest costs due to lower borrowings resulting from reduced inventories.

"The 1976 earnings gain was accompanied by a corresponding strengthening of the company's overall financial position," Anderson said.

"Debt was reduced more than $70 million, inventories declined by more than $40 million and our cash position improved markedly."

Expenditures for research and development last year totaled $94.3 million, up 11% from the $85 millon spent in 1975. Another substantial increase in R&D expenditures has been budgeted for 1977, Anderson said.

Anderson said the company expects 1977 to be a good year, citing as favorable factors improving business conditions both domestically and abroad, a large order backlog and the scheduled release of several major products including additional models in the Criterion series.

"The year 1976 brought the successful completion of a four-year transition which was unprecedented in NCR's history.

"The company is now prepared, organizationally and in terms of products and people, to move into a new period of revenue and earnings growth.

"Our 1977 objectives reflect that goal," Anderson said.

CDC Year Net Up 29%

MINNEAPOLIS — Control Data Corp. reported a 43% increase in earnings for the fourth quarter of 1976, a 29% increase for the year.

Earnings for the fourth quarter rose to $11.8 million or 68 cents a share, including $3.4 million from the computer business and $8.4 million from the commercial credit operation.

This compares with earnings of $8.3 million or 47 cents a share in the 1975 quarter of which $5.1 million was from the computer business and $3.2 million from the financial side.

Revenues for the quarter were up to $387.5 million from $354.8 million a year ago.

Earnings from computer operations totaled $12.6 million for the year, up 35% over $9.3 million in 1975, while earnings from financial services increased 27% to $36 million from $28.4 million in 1975.

Combined 1976 revenues were up 5% to $2 billion from $1.9 billion in 1975.

Computer business revenues totaled $1.36 billion compared with $1.24 billion in 1975, while financial services revenue was $650.9 million in 1976 compared with $675.1 million a year ago.

Earnings Grow 22% at Honeywell, Revenues Rise in Fourth Quarter

MINNEAPOLIS — Honeywell, Inc. reported an earnings increase of 22% for the fourth quarter, coupled with a 13% increase in revenue.

Earnings in the quarter were $43.2 million or $1.95 a share, including a $3.2 million tax credit. Earnings in the 1975 quarter were $33.3 million or $1.68 a share, including a $423,000 tax credit.

Revenues were $733 million compared with $650 million in the previous fourth quarter.

For the year, earnings rose 38% to $113 million or $5.17 a share from 1975's $77.8 million or $3.61 a share. This included $7.8 million tax credit in 1976, $1.3 million in 1975.

Revenues for the year rose 9% to $2.52 billion from $2.31 billion a year ago.

Earnings for 1976 include a capital gain of 59 cents a share from the sale of 19% of Honeywell's equity in its French affiliate, Honeywell Bull, in connection with the merger of Honeywell Bull with Compagnie Internationale pour l'Informatique (CII).

Honeywell, which owns 47% of the new company, said its earnings for 1976, but not for 1975, had been restated to reflect the reduced ownership.

Revenues in Honeywell's Information Systems (HIS) business were $914 million, an increase of 6.7% over 1975. HIS' operating profit was $41 million compared with $40 million the previous year.

Net computer bookings continued at a very strong pace in the fourth quarter, and increased significantly over the previous 12-month period. Backlog at year-end was at an all-time high.

Computer rental and service revenues increased 13.4% to $522 million in 1976. Outright sales in 1976 were about equal to a year ago.

President Edson W. Spencer said HIS' revenues, including CII-Honeywell Bull on a pro forma consolidated basis, were $1.428 billion in 1976 compared with $1.324 billion a year ago.

Pro forma operating profit, including CII-Honeywell Bull and interest income of the finance companies, was $117 million in 1976 compared with $111 million in 1975.

Honeywell is entering 1977 in the strongest financial position since 1970, having generated significant positive funds flow for the second successive year.

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But Not All Vendors Interested

Used DP Business Soaring: Monosson

NEW YORK — The used computer business is now the largest used capital asset business in the world, according to Adolf F. Monosson, president of American Used Computer Corp,

The 1976 volume of used computer sales was $1.165 billion, up from the 1970 figure of $50 million; by 1980, sales of used computer equipment will hit $2.5 billion, Monosson predicted in a speech which took swipes at most of the major mainframers.

For 1977, total computer industry sales will exceed a gross sales volume of $30 billion — larger than all other capital goods manufacturing industries combined, he recently told the Computer Industry Group of New York Society of Security Analysts.

Of this $30 billion figure, $15 billion will be hardware sales, adding to the purchased computer base of $32 billion already in the hands of end users and leasing companies. Used computer sales will climb to $1.6 billion in 1977, he added.

Predicting that the used computer industry will reach $2.5 billion by 1980, Monosson attributed the rapid growth mainly to the overall expanding computer market, which doubled in the past six years.

Another factor in the increased rate of growth is the higher levels of purchases vs. leases for IBM 370 computer systems, he said.

As users found an active market for their equipment, residual values of larger older IBM 360 computer equipment remained high. IBM's large but 12-year-old 360/65, for example, sells on the used market for 18% of its original cost, Monosson noted.

Monosson maintained that last year's $1.165 billion used equipment industry ~~has~~ had an impact on both end users and manufacturers.

Used computer dealers act as a source of supply to companies needing computer equipment for immediate delivery, while the original vendor of computer equipment usually quotes anywhere from three to 12 months for delivery, he said.

Used equipment can also save the end user substantial dollars, he added. Cost/performance is almost always higher with used equipment and software compatibility is no problem because the buyer is generally adding on similar units to his current system, he said.

IBM Restrained

Because of the U.S. Justice Department's restraining order, IBM has not been able to buy or sell used computer equipment, Monosson indicated. But IBM set up a special liaison division to work with dealers and lessors so both the vendor and the dealer can discuss their mutual problems.

Some of the dealers who only trade in IBM hardware "think IBM is tough . . . but they do not know what dealing with the other vendors is like," he added.

DEC Ignores Market

A company that ignores the used market is Digital Equipment Corp. "It's almost as if the used market didn't exist, maybe because of the fact that minicomputers are a purchased market only, with all effort put on rapid technological development and very rapidly expanding sales," Monosson said.

This action doesn't have a negative effect because DEC supports its hardware, both new and used, and will install it and provide documentation fairly promptly —for a fee. The level of support is not the same that IBM has with respect to engineering modifications, updates and maintenance, but it is tolerable, he said.

Univac's position, on the other hand, is "pure harassment," he contended. Univac does not believe engineering changes (computers are not finished in the factory, but in the field after they have been delivered) paid for by first owners but not installed should have anything to do with the second owner or be a financial liability to Univac, Monosson said.

Univac does install used equipment, maintain it and update it, but this requires a high level of daily bickering with them at high expenses, he claimed.

Faced with this level of harassment, competing on a used equipment basis with Univac itself is difficult; Univac usually wins, he said.

This tends to drive down the prices and consequently the residual values of used Univac equipment and leaves unhappy hardware purchasers, Monosson stated.

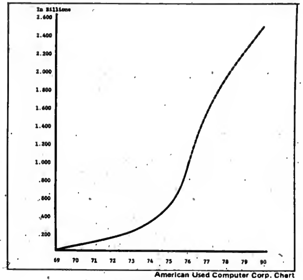
There are also computer companies that attack the dealer or second user. They spread stories, have innuendos, do not support their software or used hardware and cut prices of used equipment to any price level to get a deal, Monosson said. A prime example is Honeywell, he contended.

Honeywell originally made public its nonsupport philosophy and the proprietary nature of its software just over a year ago. The dealers and brokers stopped buying any used Honeywell hardware and the market virtually died; Honeywell destroyed the confidence of its own users, Monosson said.

Another story of attack is Burroughs — having been in the old bookkeeping machine business, it had to take trade-ins to sell new machines, and consequently, set up a market mechanism to handle these trade-ins which carried over into the computer business, Monosson said.

Burroughs offers trade-ins on its hardware substantially over the market price that any dealer or user would pay, then refurbishes this equipment and competes with either dealers or customers in the sale of used equipment; it is almost always low bidder, he added.

Burroughs also doesn't understand the real meaning of a maintenance agreement and its transferability, creating more problems than Univac for the second owner of its equipment, he claimed. But because Burroughs has manufactured "some of the best hardware ever produced," it retains a very loyal user base, Monosson told the analysts.



American Used Computer Corp. Chart

Growth of Used Computer Market
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Sligos and CPP Form Joint Venture

LONDON — Sligos, a leading software and systems house in France, has entered into an agreement with Computer Program Products Ltd. (CPP), the international products marketing company of the CAP-CPP Group, to form a jointly owned company to market computer products in France.

The company, to be known as Sligos-CPP, will be owned 51% by Sligos and 49% by CPP. It will market and support products sold until now by Sligos (Atos, Byblos, Dauphin, Gael 3, Pagos, Gespos, Shadow) and has been awarded the exclusive license to market Boole & Babbage products in France.

The company will also sell and support the CPP product SAM, which already has a French user in Banque Nationale.

Study Finds Canadian Services Emphasizing RJE

VANCOUVER, Canada — The remote-computing services industry in Canada is dominated by remote job entry (RJE) processing. The largest vendors concentrate on this business, and they have been able to sell the idea of replacing in-house CPUs with RJE terminals, according to a study by Info-Dyne, Inc.

In contrast, contracts for on-site facilities management and/or total systems management are rare, the study found.

"Although time-sharing is not as popular as it is in the U.S., many vendors are gradually adding interactive capabilities to their RJE services. They are becoming 'full service vendors,' " Info-Dyne said.

More Than 150 Active

Over 150 Canadian DP service firms are presently active. Of these, 67 offer RJE services and 53 offer an interactive computing capability. But only 13 organizations are major competitors for the Canadian market, Info-Dyne noted.

In a study of those 13 vendors, Info-Dyne found "four of these vendors have concentrated on time-sharing and seven of the vendors base their marketing plan on the availability of combined services.

"But the figures are deceptive. The successful Canadian vendor depends on significant remote batch loads for favorable bottom-line results.

"In some instances, interactive computing capability is used only as a lead-in to the sale of either hardware or the more profitable batch processing," the report stated.

In terms of hardware, two influences — nationalistic pressure and pressure to conform — have worked to structure the environment in Canada, Info-Dyne noted.

As a result, only Boeing Computer Services, Control Data Corp. and General Electric use U.S.-based hardware to service Canadian users, the study found.

IBM systems, it also found, dominate the remote-computing services industry.

"Canadian vendors tend to stay close to the standard operating system software supported by the equipment manufacturers," Info-Dyne stated, noting the exceptions of Comshare (Xerox equipment) and Computer Sciences (Univac equipment), which use operating systems extensively customized by their U.S. affiliates.

International News

Foreign Orders & Installations

Hyakugo Bank Ltd. of Mie, Japan, has ordered a Univac 1100/22 system for information retrieval and customer file development applications.

E.C. Baumann KG Druckerei & Verlag of northern Bavaria has ordered dual 8050 systems and an 8030 system from Information Computer Systems GMBH for automatic typesetting.

The European Economic Commission has ordered an International Computers Ltd. (ICL) Model 2980 to be the central component of its DP facility.

Lufthansa German Airlines has ordered a Univac 1100/80 system for its Frankfurt operating base to be used for passenger seat reservations, check-in, hotel reservations, message switching, operations control and instructional applications.

Bankgiro, a financial clearinghouse in Amsterdam, The Netherlands, which expects to handle all money transfers in that country by 1978, has ordered a Burroughs Corp. B7700 system.

Prommashimport of Moscow has ordered two Measurex Corp. Model 2000 digital process control systems for paper machines at its Solikamsk newsprint mill.

Kaufhof AG, headquartered in Cologne, West Germany, has ordered two Input 80 Model C1 optical character recognition systems from Recognition Equipment GmbH for its department stores.

A Danish department store group, Magasin, has ordered 650 NCR 2151 retail terminals and five NCR 725 minicomputers.

Two Japanese insurance companies, Daihyaku Mutual Life Insurance Co. Ltd. and Fukoku Mutual Life Insurance Co. Ltd., have ordered Univac 1100/41 and 1100/42 systems respectively.

Redfearn National Glass, Ltd. of York, England, has ordered a Honeywell Level 64 system including a 64/20 CPU with 160K of memory, 140M bytes of disk storage, two tape units, a 600 line/min belt printer and a 500 card/min reader.

Barclays Bank Ltd. has ordered four copies of the Strobe performance monitor from Management Systems and Programming Ltd.

France's Caisse Nationale Militaire de Securite Sociale has ordered a Honeywell Level 66 system for controlling the settlement of social security allowances of 1.5 million active and retired military personnel and their families.

The Italian Supreme Court of Cassation in Rome has ordered a second Univac 1106 processor, additional disk drives, magnetic tape units, a high-speed printer and a card reader.

The UK's Department of Health and Social Security has ordered 13 Mohawk Data Sciences Corp. System 2400s to prepare pension and welfare payment check books.

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Orders & Installations

Metropolitan Life Puts in Order For Two Dual-Processor 66/85s

NEW YORK — Metropolitan Life Insurance Co. has ordered two of Honeywell Information Systems, Inc.'s (HIS) dual-processor Model 66/85s introduced earlier this month.

One of the two systems will be installed at Metropolitan Life's Greenville, S.C., DP center in mid-1977, according to R.R. Douglas, HIS marketing vice-president. The other will be installed later in the year at either the Scranton, Pa., or Wichita, Kan., DP center.

Each dual-processor installation will be configured with 512K words of 4K main memory; several dual-density MSU0451 200M-byte disk units; 32 9-track, 1,600 bit/in. MTUO600 tape units; a 1,200 line/min printer; two card readers; and a card punch.

Application programs originally developed for HIS Model 8200 computers at both sites will be enhanced and simulated on the 66/85 systems as part of HIS' and the insurer's "migration project."

The combined systems are valued at $11.1 million.

Other Orders & Installations

Century Hardware of Milwaukee has ordered 20 Sycor Model 351 terminal systems for invoicing and order processing at its government Contractor-Operated Civil Engineering Sales Store network offices at 12 military installations.

The Sorg Paper Co. of Middletown, Ohio, has ordered two Measurex 1500 systems for its fine paper machines.

ITT Domestic Transmission Systems, Inc. has ordered computer systems under a contract with Modular Computer Systems, Inc. that could total $3.5 million.

Eastern Airlines has ordered automatic call distribution systems with tandem switching for six regional reservation centers from the Collins Commercial Telecommunications Division of Rockwell International's Electronics Operations.

RCA Missile and Space Radar has ordered two MD640 militarized disk storage systems, each consisting of a disk drive assembly with removable disk pack, a microprogrammed controller and a complete power system, from Control Data Corp.

Looart Press, stationery printers in Colorado Springs, Colo., has ordered a Honeywell Information Systems 66/10 system with 192,000 words of 4K MOS main memory for market analysis and sales order-processing applications.

Massasoit Community College in Brockton, Mass., is installing an S110 system on lease from Harris Computer Systems. The system includes 120K bytes of main memory, a 300 card/min reader, a 200 line/min line printer, 28M bytes of on-line disk storage and a communications multiplexer.

International Paper Co. has ordered a Measurex 2000 for its pulp and paper mill in Texarkana, Texas, to control production of milk carton stock and bleached pulp.

The State of Washington has placed an $800,000 order with Sanders Data Systems for programmable CRT terminals to be used by the Division of Employment Security for on-line inquiry and updating of job records. The installation will be the first phase of a planned statewide system for use by the courts, Personnel Department, Board of Prison Terms and Paroles and Washington State University's service center.

St. Mary of the Plains Hospital in Lubbock, Texas, has ordered Hewlett-Packard patient monitoring equipment for its coronary care unit, including a minicomputer-based arrhythmia detection system, bedside monitoring instruments for 11 beds in the intensive care and coronary care units and a computerized catheterization laboratory system.

Hoover Ball and Bearing Co. has ordered two Honeywell systems valued at $3.2 million, a Model 66/20 and a Model 66/10, to be configured with Datanet 66/32 front-end network processors that will coordinate communications at two of the firm's regional data centers.

Vanderbilt University has ordered the first Digital Equipment Corp. Decsystem-1099 for academic and research applications.

New Registrations

MINNESOTA MINING AND MANUFACTURING CO. (3M), 3M Center, St. Paul, Minn. 55101, filed to register 329,971 shares of common in exchange for the business assets and goodwill of Medie Networks, Inc. (MNI). If MNI is subsequently liquidated, the 3M shares will be exchanged for MNI shares at the approximate rate of one 3M share for each 1.65 MNI shares. No underwriter is involved.

AUTOMATIC DATA PROCESSING, INC. (ADP), 405 Route 3, Clifton, N.J. 07015, a DP service firm, filed to register up to 240,015 shares of common. It is proposed to offer these shares in connection with the acquisition by ADP of the CPI Group, Inc. through the merger of CPI with and into a wholly-owned subsidiary of ADP. Upon the merger, each outstanding share of CPI common will be converted to 0.237125 shares of ADP common. No underwriter is involved.

SPERRY RAND FINANCIAL CORP., 1290 Ave. of the Americas, New York, N.Y., a wholly owned subsidiary of Sperry Rand Corp., filed to register a public offering of $125 million of notes due 1985. The notes will not be redeemable until Feb. 1, 1983. On and after that date, the notes will be redeemable at the option of the company at their principal amount, plus accrued interest. Blyth Eastman Dillon & Co., Inc. is the underwriter involved.

WALLACE BUSINESS FORMS, INC., 4600 W. Roosevelt Road, Hillside, Ill. 60162, a manufacturer and retailer of continuous business forms for computers, filed to register 162,903 shares of common, which may be offered for sale by certain selling stockholders from time to time in negotiated transactions or otherwise at prevailing market prices or at negotiated prices. No underwriter is involved.

TERADYNE, INC., 183 Essex St., Boston, Mass. 02111, a test equipment firm, filed to register 10,000 shares of common, presently held by Alexander V. d'Arbloff. No underwriter is involved.

TEKTRONIX, INC., 14150 S.W. Kerl Breun Drive, Tektronix Industrial Park, Beaverton, Ore. 97077, an electronics display and measurement firm, filed to register 5,000 common shares, to be offered for exchange by a stockholder of Tektronix for shares of Fidelity Exchange Fund, a Nebraska limited partnership which is an open-end diversified investment company. No underwriter is involved.

DATA GENERAL CORP., Route 9, Southboro, Mass., filed to register a maximum of 344,148 common shares, to be issued in connection with the acquisition of Digital Computer Controls, Inc. by Data General Corp. pursuant to a merger of a wholly owned subsidiary of Data General Corp. with and into Digital Computer Controls, Inc. No underwriter is involved.

CENTRONICS DATA COMPUTER CORP., Hudson, N.H. 03051, a DP firm, filed to register 31,000 shares of common, which may be offered for sale from time to time by a selling shareholder at prices current at the time of sale. No underwriter is involved.

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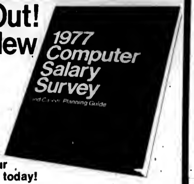

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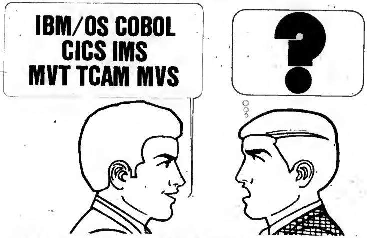

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A progressive Michigan College has two positions available for individuals qualified as programmers and/or orogrammer analysts. Two-four years experience as a Computer Programmer or Programmer/Analyst will be required. Exoerience on an I.B.M. 370/145 under DOS/VS preferred. Installation of a data base/data communications system is now in progress. College degree in Data Processing is desirable. Reply in confidence including salary requirements and work history to: Ferris State College, Personnel Office, Big Rapids, MI 49307.

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Major S.E. Corporation headquartered in Atlanta seeks experienced systems programmers for large IBM 370 installation. Individuals should have experience in one of the following areas: data base design and implementation using IMS, system performance measurement and evaluation, DP equipment and software selection. We offer career opportunity with progressive company, Atlanta location, excellent benefit package and competitive salary. For promot consideration, send resume with salary history to:

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Our candiate should have noteable achievements to be proud of.

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This is a difficult demanding job but for the right candidate it provides challenge, excellent compensation, and an opportunity to develop into senior management with a growing public corporation. Please send your resume and salary history to:

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Background should include 3 or more years in computer or computer-realted manufacturing with 2 or more years in a supervisory or managerial role. BSEE; advanced degree in Business or Engineering management would be helpful. This position is located in Lawrence, Mass. within easy commuting distance to Boston or southern New Hampshire.

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Due to our planned future growth and policy of promotion from within, we offer you virtually unlimited career potential. New project management and high level technical positions are being created on almost a daily basis. To help us groom our people to meet this need, we have created an extensive in-house training program that is designed to stretch your capabilities to their fullest potential. If you're the kind of person that needs "head room" to grow — we're ready to provide it through exciting and challenging initial assignments and a planned career path development program. And we look to a long term relationship as reflected by our unique benefit package which includes highly competitive compensation levels, dental insurance, a full tuition refund program, twenty-three days of combined vacation and holidays the first year of employment, etc.

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If you qualify for any of the position areas outlined above and would like complete details regarding our organization and your long term career potential, call Jim Miles at our special toll free number 1-800/821 2270 X308 at your earliest convenience. Our lines will be open 24 hours a day, 7 days a week. (Missouri residents please call 1-800/892 7655). If for any reason you are unable to call, write to our Vice President — Computer Services in confidence. A detailed experience resume is not required. We are an equal opportunity employer. M/F. CW Box 4904, 797 Washington Street, Newton, Mass. 02160.

The Software Documentation people we're looking for probably aren't looking for a job.

We're the Digital Software Documentation Group, a proud collection of Writers and Editors. We like being part of this organization, not just because Digital is an important computer company, but because we're important to Digital.

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Our Professional Services Division's current and anticipated 1977 requirements offer opportunities which provide excellent career-growth at locations throughout the United States. These positions include a variety of technical and educational requirements.

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We are looking for candidates with a Bachelor's Degree or equivalent experience. Requirements include CDC 6000/7600 or CYBER 70/170 experience. Knowledge of SCOPE, KRONOS, NOS and assocaited product sets. These persons will be required to provide on-site systems support to large scale computer users, providing technical assistance, liaison and programming consultation.

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Should have Bachelor's Degree or equivalent experience — minimum of 3-5 years in the data processing industry. Desired candidate would have experienced the analysis of major sales prospect's hardware and software requirements; prepared and given sales oriented presentations. Should have extensive knowledge of CDC products in one of the following areas; CDC large systems — 6000/7600, CYBER 70/170 series; CDC small systems-1700/CYBER 18. These positions will provide pre and post sales support to marketing.

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If you meet the above qualifications, we need your energy, expertise, and experience. Your resume indicating travel and relocation restrictions, current salary and position applied for should be addressed to:

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Our continued growth has opened new opportunities for System Programmers with and without performance analysis experience. Applicant should have a working knowledge of assembler Language and OS/VS1 internals. The performance analysis position requires experience with hardware/software monitors.

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Skills required include 3 to 4 years experience in OS/VS intervals, SYSGENS, Telecommunications, Timsharing Control Programs and/or CICS/VS.

Excellent salary, top benefits and growth potential with this energy leader. Send complete resume including salary history to Personnel Department:

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Personnel Office
Knox College
Gatesburg, IL 61401
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INFO. SYSTEMS TRAINING UNIT SUPERVISOR

Responsible for planning, development and administration of statewide management and technical data processing training program. Instruction includes live presentation & video training program. Minimum Requirements' teaching certificate or 2 years training experience, degree or equivalent in Bus. Adm. or Computer Sci. and 5 years experience involving: management principles; data processing equipment; programming, and systems analysis; business or public administration; and education or training. Salary Range $17,364-$22,176/yr.

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Plan, direct and participate in software/hardware installation and modification; supervise software support unit and coordinate user software support. Minimum Requirements: degree or equivalent; six years ADP related experience at least four of which must be systems analyst experience with at least two years experience in supervision or project leadership; solid understanding of operating system internals, utility software, teleprocessing internals and hardware architecture. Expanding installation currently includes 370/155 and 158, MVT and MVS, wide range of software packages including ATMS, CICS, ROSCOE. Salary range $20,112-$25,680/yr.

To Receive Employment Application Forms Send Resume by Feb. 25, 1977 to:

STATE OF OREGON
D. Gunderman
Executive Department
Data Systems Division
240 Cottage St. SE
Salem, OR 97310
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Programming Manager

New position created within Data Processing Dept. of SF-based NYSE company for experienced Programming Manager to supervise small programming staff in 370-145 OS/VS1 environment. Candidates must have strong COBOL background with OS software and data file management experience. Accounting background with general ledger systems experience essential. Telecommunications familiarity also desirable. Excellent starting salary, fringe benefits and advancement opportunity Reply in confidence to:

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1. Coordinator — The Coordinator is expected (a) to provide creative leadership, as a teaching administrator at the associate professor's level, in curriculum revision and programmatic development; (b) to assume a major role in the recruitment, selection, direction, and evaluation of all instructional personnel; (c) to oversee an evolving Internship program; (d) to act as a resource person and adviser to students majoring in Computer Systems; (e) to represent the department on various academic/administrative councils.
2. Assistant Professor — Teacher-scholar being sought; one who enjoys a teaching-advising role — principally at the undergraduate level; one who has the ability to interface effectively with faculty and students in other business-related disciplines.

Applicants for both positions are expected to have an earned doctorate in a field directly related to Computer Systems; extensive knowledge of programming, systems analysis, or data processing management with emphasis on business applications; and some previous teaching experience.

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Move to a new climate in Southern California

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Your work will be in modern, functional facilities with a sophisticated IBM/IMS utilizing OS, VS-2 data base, data communication. We are involved in an extremely large-volume program designed to handle and expedite claims processing, plus all aspects involving finance and personnel. Experience in data base design, systems analysis, or programming with exposure to IMS is needed. Minimum of 2 years experience is required for some openings, mimimum 5 years experience for senior level positions
In addition to avenues for career expansion, we offer a top salary, generous company paid benefits, and relocation allowance.

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Have immediate opening in a 370/158 environment for a programmer with experience in at least one high level language. Systems analysis experience is desirable. Excellent benefits.

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COMPUTER SYSTEMS

DEC SYSTEM- 20

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Join A Company That's Growing 40-50% Per Year

AMS' Computer Services Division (CSD) currently operates two large-scale computers: IBM 360/65 and 370/155. To keep pace with the expanding market, we are installing a new DEC SYSTEM-20. This installation creates an opportunity for a highly motivated and qualified professional to come in at the start and help buid a successful operation. This person will report to our Vice President of our large Computer Center and perform both technical and customer support functions.

Candidates must have demonstrated their ability to work successfully in the DEC SYSTEM-20 or DEC SYSTEM-10 environment; desirable technical qualifications should include:

- Minimum of two years of experience with DEC-10, including a working knowledge of its operating system.
- Knowledge of data base management systems.
- Experience with TOPS-20 or TENEX.
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In addition, candidates should have experience in:

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In seven years AMS has grown into a successful, nationwide firm; sales in 1976 exceeded $12 million. We have expanded by internal growth and by continuing to offer new services. The DEC SYSTEM-20 shold add significantly to our overall success; thus, this technical/customer support position is an important, high growth position. Starting salary will be commensurate with experience and qualifications; we also offer comprehensive company paid benefits, and moving expenses will be paid by AMS.

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Vice President

AMERICAN MANAGEMENT SYSTEMS, INC.
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Our Data Processing staff is preparing for a transition to the project team concept. Your experience and input at this exciting time offers challenge and involvement. If you are looking for a fulfilling programming position, this is it!

Consider an excellent benefits package, special training programs, the amenities of N.H. life, a progressive working enviromment and a competitive starting salary.

Qualifications include two years hands-on experience and knowledge of COBOL, BAL and/or Autocoder. Familiarity with an IBM 370/135 DOS/VS environment or knowledge of insurance applications would be a plus.

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CONTROL DATA CORPORATION is seeking professionals who have Honeywell 600 experience to work on the Mass Storage System, which is a major new development in the computer industry.

SYSTEMS PROGRAMMERS

Career opportunities for programmers to develop software for the Mass Storage System. Development will be on current Honeywell GCOS system. Ideal candidates will have GMAP experience, COBOL experience and file design experience.

COBOL PROGRAMMERS

Also working on the Mass Storage System, candidate should have COBOL and file design experience utilizing Honeywell's 6000 equipment. Previous IBM assembler experience a plus.

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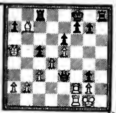

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All nominations and applications must be postmarked no later than February 28, 1977; must be received no later than March 7, 1977; and must be sent to:

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Oregon State System of Higher Education
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Please forward your resume outlining salary history to: Dorothea C. Lynch, GTE Sylvania, Eastern Division, 77 "A" Street, Needham, MA 02194

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Fall 1977**

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We're looking for above-average talent. You can expect an above-average compensation and benefits package. Please direct your response to Manager, Professional Employment, Amdahl Corporation, 1250 East Arques Avenue, Sunnyvale, California 94086. To expedite your application, please indicate on your resume or letter the response number contained in the text of the position offering. We are, of course, an equal opportunity employer.

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The successful applicant will have a Master's degree in a computer-related discipline or an equivalent combination of education and experience, at least three years of supervisory experience, experience in computer networking, and a broad background in use of computers. Preference will be given to individuals with experience in both academic and administrative computing.

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047	$1500	$60/Mo.	088	$2500	$175/MO.	552	$1000	$40/Mo.
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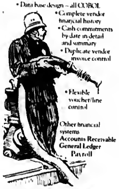

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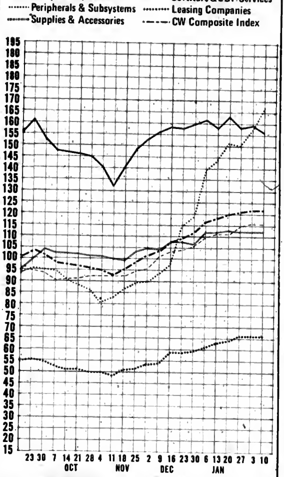

Earnings Reports

COMPUTER CONSOLES
Nine Months Ended Sept. 30

	1976	1975
Shr Ernd	a. . .	$.36
Revenue	$6,475,584	6,312,081
Tax Cred	. . . .	284,500
Earnings	19,326	592,916

a-Preferred dividend requirements exceeded income.

COMPUTER DIMENSIONS
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.12	$.21
Revenue	3,580,349	2,978,771
Tax Cred		152,700
Earnings	196,258	333,686
9 Mo Shr	.37	.46
Revenue	9,975,474	8,474,789
Tax Cred	57,345	341,900
Earnings	602,894	717,691

COMPUTER USAGE
Year Ended Sept. 30

	1976	1975
Shr Ernd	. . .	$.60
Revenue	$9,179,234	5,819,919
Tax Cred	. . . .	151,034
Earnings	(446,321)	480,016
3 Mo Shr	.04	.04
Revenue	2,419,149	1,702,533
Tax Cred	. . .	13,534
Earnings	37,194	35,575

CUBIC
Year Ended Sept. 30

	1976	1975
Shr Ernd	$2.16	$.65
Revenue	110,101,000	82,149,800
Earnings	4,786,700	1,447,300
3 Mo Shr	.59	.29
Revenue	29,778,600	19,806,200
Earnings	1,304,000	639,000

APPLIED DEVICES
Year Ended Oct. 31

	1976	1975
Shr Ernd	$.50	$.41
Revenue	22,689,000	20,106,000
Tax Cred	820,000	775,000
Earnings	2,005,000	1,602,000
3 Mo Shr	.22	.14
Revenue	7,042,000	6,890,000
Tax Cred	342,000	266,000
Earnings	904,000	582,000

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797 Washington Street
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Robert Ziegel
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797 Washington Street
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Phone: (617) 965-5800

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2125 Center Avenue
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Bill Healey
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Donna Dezelan
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COMPUTERWORLD
1212 Hearst Bldg.
San Francisco, Calif. 94103
Phone. (415) 495-0990

Los Angeles
Bill Healey
Western Regional Manager
Jim Richardson
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Chris Canary
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1434 Westwood Boulevard
Los Angeles, CA 90024
(213) 475-8486

Japan:
Mr. Shigema Takahashi
General Manager
Dempa/Computerworld
1-11-15 Higashi Gotanda
Shinagawa-ku, Tokyo 141
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United Kingdom:
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TRADE*QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 9, 1977

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

EXCH		PRICE 1976-77 RANGE (1)	CLOSE FEB 9 1977	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	AMDAHL CORP	23- 40	33 3/4	- 3/4	-2.1
N	BURROUGHS CORP	59-108	68 3/4	-5 1/4	-7.0
O	COMPUTER AUTOMATION	10- 23	23 1/8	+1 5/8	+7.5
N	CONTROL DATA CORP	18- 27	23 1/2	- 3/8	-1.5
N	DATA GENERAL CORP	40- 60	42 1/8	0	0.0
O	DATAPOINT CORP	24- 46	25	+1 1/2	+6.3
O	DIGITAL COMP CONTROL	2- 7	6 5/8	- 1/8	-1.8
N	DIGITAL EQUIPMENT	44- 60	43 3/4	-2 5/8	-5.6
N	ELECTRONIC ASSOC.	2- 5	2 5/8	- 1/8	-4.5
A	ELECTRONIC ENGINEER.	7- 16	8 1/8	- 3/4	-8.4
O	FOUR-PHASE SYSTEMS	15- 21	15 1/4	- 3/8	-2.3
N	FOXBORO	28- 51	43 3/4	- 3/4	-1.6
O	GENERAL AUTOMATION	4- 11	7 3/4	- 3/8	-4.6
G	GRI COMPUTER CORP	1- 1	3/8	- 1/8	-25.0
N	HEWLETT-PACKARD CO	71-117	71	-4	-5.3
N	HONEYWELL INC	54- 56	44 3/4	-1 1/4	-2.7
N	IBM	227-258	268	-6 1/4	-2.2
C	MANAGEMENT ASSIST	1- 9	8 1/8	- 1/4	-2.9
O	MEMOREX	17- 33	24 3/4	0	0.0
O	MICRODATA CORP	10- 28	13 7/8	+1 5/8	+13.2
O	MODULAR COMPUTER SYS	5- 14	6	+ 1/8	+2.1
N	NCR	24- 38	56 7/8	- 7/8	-2.3
O	PRIME COMPUTER INC	4- 18	15	-1 1/4	-7.6
N	PERKIN-ELMER	18- 27	18	-1 1/2	-7.6
N	RAYTHEON CO	45- 67	57	-1 1/4	-2.1
N	SPERRY RAND	38- 52	39 1/4	+1	+2.6
O	SYCOR INC	8- 31	15 5/8	+1 5/8	+13.5
A	SYSTEMS ENG. LABS	5- 10	6 1/4	- 3/8	-5.6
N	VARIAN ASSOCIATES	12- 19	18 7/8	+ 1/8	+0.6
A	WANG LABS.	11- 20	15 1/2	+1 3/8	+9.7
	LEASING COMPANIES				
O	BOOTHE COMPUTER CORP	1- 9	10 1/8	- 1/8	-1.2
O	COMDISCO INC	3- 12	12	+ 1/2	+4.3
A	COMMERCE GROUP CORP	2- 3	2	- 1/8	-5.8
A	COMPUTER INVSTRS GRP	1- 3	1 1/2	- 3/8	-20.0
M	DATRONIC RENTAL	1- 8	1 1/2	0	0.0
A	DCL INC	1- 2	1 5/8	- 1/4	-13.5
N	DPF INC	5- 8	7 5/8	+ 1/8	+1.6
N	ITEL	6- 16	15 1/4	+ 3/8	+2.5
N	LEASCO CORP	6- 22	15 3/8	-1 1/8	-5.4
O	LEASPAC CORP	0- 1	3/4	0	0.0
C	NRG INC	0- 1	1/4	+ 1/8	+100.0
A	MCNEEP TEK CORP	6- 11	10 5/8	+1 3/4	+15.7
N	U.S. LEASING	7- 12	11 1/4	+ 1/8	+1.1

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 5 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		PRICE 1976-77 RANGE (1)	CLOSE FEB 9 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 5	5 1/4	- 1/4	-4.5
O	DATA 100	6- 13	7 5/8	0	0.0
A	DATA PRODUCTS CORP	5- 15	12	+ 1/8	+1.0
O	DATA TECHNOLOGY	1- 3	3	- 1/8	-4.0
O	DATUM INC	1- 2	1 1/8	0	0.0
O	DECISION DATA COMPUT	1- 4	2	+ 1/8	+6.6
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
N	ELECTRONIC M & M	1- 4	4	- 1/8	-3.0
O	FABRI-TEK	1- 1	1 1/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	3/8	- 1/8	-25.0
N	HAZELTINE CORP	4- 12	11 1/8	0	0.0
N	HARRIS CORP	25- 57	51	- 5/8	-1.5
A	INCOTERM CORP	9- 20	13 7/8	- 5/8	-4.3
O	INFOREX INC	3- 7	6 1/8	- 3/8	-5.7
O	INFORMATION INTL INC	10- 18	11 7/8	- 1/8	-1.0
O	INTEL CORP	47-105	54	- 1/2	-0.5
A	LUNDY ELECTRONICS	3- 7	4 1/4	- 1/2	-10.5
O	MSI DATA CORP	3- 8	7 1/8	- 1/4	-3.3
N	MILGO ELECTRONICS	15- 37	37 1/8	+6 5/8	+21.7
N	MOHAWK DATA SCI	3- 10	7	- 1/4	-3.4
O	PENRIL CORP	1- 3	2 5/8	0	0.0
A	PERTEC CORP	3- 9	7 5/8	- 5/8	-4.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 10	2	0	0.0
O	QUANTOR CORP	4- 6	4 5/8	- 1/8	-2.6
O	RECOGNITION EQUIP	6- 11	5 3/8	- 1/8	-1.3
N	SANDERS ASSOCIATES	6- 12	11 1/2	+ 7/8	+5.2
O	SCAN DATA	1- 4	1 5/8	- 1/8	-12.0
O	STORAGE TECHNOLOGY	5- 13	11	- 3/8	-3.2
C	T BAR INC	5- 10	7 1/2	+ 1/4	+3.4
O	TALLY CORP.	4- 6	6 1/4	+1 1/8	+21.9
O	TEC INC	3- 9	8 1/2	0	0.0
N	TEKTRONIX INC	45- 65	58 1/4	+ 1/4	+0.4
N	TELEX	2- 5	2 7/8	- 1/8	-4.1
O	WANGCO INC	11- 22	17 1/2	0	0.0
O	WILTEK INC	1- 2	1/4	0	0.0
	SUPPLIES & ACCESSORIES				
O	ADVANCED SYSTEMS INC	1- 4	3 3/8	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/8	- 1/8	-5.8
A	BARRY WRIGHT	6- 11	10 7/8	0	0.0
O	CYBERMATICS INC	0- 1	5/8	0	0.0
A	DATA DOCUMENTS	25- 45	41	0	0.0
O	DUPLEX PRODUCTS INC	15- 24	14 1/4	- 1/8	-0.8
N	ENNIS BUS. FORMS	6- 8	6	+ 1/8	+2.1
O	GRAHAM MAGNETICS	8- 13	12 1/2	- 3/4	-5.6
O	GRAPHIC CONTROLS	13- 19	15 1/4	0	0.0
N	3M COMPANY	49- 66	45 3/8	-1 5/8	-3.1
O	MOORE CORP LTD	31- 51	31	-1 1/4	-3.8
N	NASHUA CORP	11- 20	17 3/8	+ 7/8	+5.3
O	STANDARD REGISTER	15- 19	18	- 1/4	-1.3
O	TAB PRODUCTS CO	5- 16	15 1/4	- 1/2	-3.1
N	VARCO	19- 25	20 3/4	0	0.0
A	WABASH MAGNETICS	4- 14	13 1/2	+2 1/8	+18.6
N	WALLACE BUS FORMS	19- 25	20	- 1/2	-2.4

EXCH		PRICE 1976-77 RANGE (1)	CLOSE FEB 9 1977	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	1 5/8	0	0.0
O	ANACOMP INC	6- 11	8 1/2	+ 1/8	+1.4
A	APPLIED DATA RES.	2- 7	6 1/4	+ 1/4	+4.1
N	AUTOMATIC DATA PROC	17- 55	23 3/4	- 1/4	-1.0
O	COLEMAN AMERICAN COS	2- 6	1 7/8	- 1/8	-6.2
O	COMPU-SERV NETWORK	3- 15	14	- 1/4	-1.7
O	COMPUTER DIMENSIONS	3- 7	6 5/8	0	0.0
O	COMP ELECTION SYSTMS	5- 9	7 1/2	+ 1/2	+7.1
O	COMPUTER HORIZONS	1- 2	1 1/4	0	0.0
O	COMPUTER NETWORK	2- 8	7 1/4	+ 3/4	+11.5
N	COMPUTER SCIENCES	4- 9	7 1/2	- 1/2	-6.2
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
C	COMPUTER USAGE	2- 6	2 1/2	+ 1/8	+5.2
O	COMSHARE	2- 9	6	- 1/4	-4.0
O	DATA DIMENSIONS INC	2- 5	4 7/8	+ 3/8	+8.3
O	DATATAB	1- 2	1 1/2	- 1/8	-7.6
N	ELECTRONIC DATA SYS.	12- 19	18 3/8	+ 1/4	+1.3
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	2 1/2	0	0.0
C	IRS COMPUTER MARKET.	1- 2	3/4	0	0.0
O	KEANE ASSOCIATES	2- 4	2 5/8	- 1/8	-4.[illegible]
O	KEYDATA CORP	1- 5	2 3/4	0	0.0
A	LOGICON	5- 9	9 1/8	- 1/8	-1.5
A	MANAGEMENT DATA	1- 3	1 1/2	0	0.0
A	NATIONAL CSS INC	13- 25	25	- 1/4	-1.0
O	NATIONAL DATA CORP	4- 7	6 1/8	+ 1/4	+4.2
A	ON LINE SYSTEMS INC	17- 23	21 1/2	+1 1/2	+7.5
N	PLANNING RESEARCH	5- 5	4 5/8	- 1/8	-2.7
C	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2	- 1/8	-5.8
O	REYNOLDS & REYNOLDS	13- 21	18 1/4	- 1/2	-2.6
O	SCIENTIFIC COMPUTERS	1- 1	1 7/8	0	0.0
O	TYMSHARE INC	14- 28	1[illegible] 1/2	- 1/2	-5.1
A	URS SYSTEMS	3- 5	4	+ 1/8	+3.2
N	WYLY CORP	1- 7	1 1/2	- 1/4	-14.2
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	8- 14	13 7/8	+ 1/8	+0.9
O	ADVANCED MEMORY SYS	4- 10	7 5/8	- 7/8	-10.2
N	AMPEX CORP	5- 10	8 3/8	- 1/8	-1.4
O	ANDERSON JACOBSON	2- 4	3 5/8	+ 1/8	+3.9
C	APPLIED DIG DATA SYS	13- 25	14 3/8	+1 5/8	+10.5
O	BEEHIVE MEDICAL ELEC	3- 12	10 3/4	- 5/8	-5.4
A	BOLT,BERANEK & NEW	7- 11	7	- 3/8	-5.0
N	BUNKER-RAMO	5- 11	10 1/8	- 1/8	-1.2
A	CALCOMP	4- 7	4 3/8	- 3/8	-7.8
O	CAMBRIDGE MEMORIES	0- 4	1 1/8	- 1/4	-18.1
N	CENTRONICS DATA COMP	20- 36	29	-1 5/8	-5.2
O	CODEX CORP	22- 47	46	+12	+55.2
C	COGNITRONICS	1- 1	1 1/8	+	+5.8
O	COMPUTER COMMUN.	1- 6	5 [illegible]/8	- 1/2	-8.1
C	COMPUTER CONSOLES	4- 7	4 3/4	- 1/8	-2.5
O	COMPUTER EQUIPMENT	1- 3	1 7/8	- 1/8	-6.2
O	COMPUTER TRANSCEIVER	1- 3	1	- 3/8	-27.2
O	COMTEN	4- 13	12	- 1/8	-1.0
A	CONRAC CORP	20- 27	2[illegible] 1/4	0	0.0

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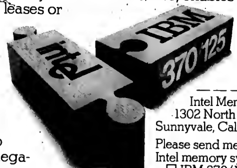

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